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ABSTRACT

This study explores the relationship between city size and quality of life as measured across environmental, social, political, systemic, preferential, and economic dimensions. Its primary objective is to assess the desirability of continued population concentration across these dimensions. It is noted that if historical distribution trends continue, by the year 2,000, two thirds of the American people will live within large metropolitan areas of one million or more people. However, recent distribution trends suggest there may be a substantial departure from these historical trends. The research summarized in this report indicates that for a substantial portion of the American population the trend to ever larger cities is considered undesirable. For them, the quality of urban life is inversely correlated with size of urban place. A conclusion of this study is that there appears to be a substantial amount of latent support for a national population redistribution policy aimed at greater population balance. For such a growth policy to be successful, it must deal with the underlying economic forces and mechanisms that create indesirable distribution patterns. (Author/AM)

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City Size and the Quality of Life

An analysis of the policy implications of continued population concentration

by

Duane Elgin, Tom Thomas, Tom Logothetti and Sue Cox

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SUMMARY

The purpose of this study was to explore the relationship between city size and quality of life as measured across a number of dimensions: environmental, social, political, systemic, preferential, and economic. We conclude, among other things, that:

- If historical distribution trends continue, we could expect, by the year 2000, to see two-thirds of the American people living within large metropolitan areas of one million or more people.
- However, recent distribution trends suggest there may be a substantial departure from these historical trends. There has been a spontaneous reversal of net migration away from metropolitan to nonmetropolitan areas--a migration reversal unlike any seen in the United States since the pre-1890 period.
- The research summarized in this report indicates that, for a substantial portion of the American population--perhaps as much as an absolute majority--the trend to ever larger cities is considered undesirable as measured across a number of noneconomic dimensions (social, environmental, political, and systemic). As such, for a substantial number of people, the quality of urban life--as measured across noneconomic dimensions--is inversely correlated with size of urban place.
- People have freedom of movement but that cannot be equated with freedom of choice if such choice is to include a range of city sizes as an important precondition to diversity.
- People have difficulty in "voting with their feet" and moving to smaller urban environments--they are allowed to do so but, given economic forces which impel further agglomeration, they are seldom able to do so.
- There appears to be a substantial amount of latent potential and support for a national population redistribution policy aimed at greater population "balance."
- For such a growth policy to be successful, it must deal with the underlying economic forces and mechanisms that create those undesired distribution patterns.

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OVERVIEW OF CITY SIZE AND THE QUALITY OF LIFE

The Problem

Unless there is a spontaneous or planned reversal, the United States will continue to undergo an urbanizing transformation, with more and more people inhabiting very large urban agglomerations. In 1940 there were 12 "great metropolitan areas" containing one million or more people; in 1970 there were 29 such areas; and, with conservative projections, by the year 2000 there may be 44 such areas containing nearly two-thirds of the American population (Pickard, 1972).[*] This rapid and substantial concentration of people into very large urban places has to some degree aggravated and/or produced many of our contemporary urban problems of congestion, pollution, ill-health, crime, loss of community, and governmental fragmentation. While we seem to be inexorably tending towards much greater levels of population agglomeration, opinion polls inform us that an absolute majority of the American people would prefer to live at a much smaller scale of community. Thus, a conflict of uncertain dimensions emerges: on one hand, our distribution projections suggest continued growth of urban scale; on the other hand, there are indications that these trends are neither preferred nor perhaps desirable for a substantial proportion of the American people. The primary objective of this report, then, is to clarify the dimensions and nature of this apparent conflict by assessing, across a number of dimensions (economic, social, political, environmental, preferential, and systemic), the desirability of continued population concentration.

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[*] The references are listed in alphabetical order at the end of each report section.

It is important to point out that this report has a policy bias. Population distribution projections indicate that the already large urban areas may become even larger, thereby capturing an increasingly substantial proportion of the total population. For people who prefer large scale living environments, distribution trends seem to insure that there will be no shortage of the preferred scales. On the other hand, for those people who prefer smaller scale living environments (and this group may be an absolute majority of the American population if we are to trust the opinion poll data), there is a need to weigh the evidence which would support policy initiatives on their behalf. The essential issue, then, is not whether to dismantle and deny large urban environments to those who wish to live in them; rather, the issue is one of degree of diversity and freedom of choice for those people who see the important component of small scale of their living environment being eliminated by the growth of massive urban agglomerations.

The Context

Conceptually, the underlying issue seems to be that of "quality of life." A city of any given size is not a goal unto itself; rather, city size seems important as it contributes to or detracts from conditions of life which are thought to be desirable.* When we ask if there is an

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*Definition of city size or city scale is elusive because there are so many different ways to define city size: legal boundaries, geographic boundaries, transportation or commuting fields, economic trade areas, county groupings, sub-state regions, trans-state regions, and so on. Because the literature embraces many different definitions of city size, it was not possible to adopt a single, rigorous definition. Admittedly, this lack of consistent definition makes the findings ambiguous for purposes of making analytical comparisons longitudinally and cross-sectionally. However, the intention of this study was to survey a broad spectrum of literature in order to suggest preliminary findings with respect to important policy issues. The shortcomings of this approach clearly demonstrate a need for additional research which will develop and refine a "optimum" city size we are really asking: what is the urban scale most conducive to the realization of some desired living environment? Since people's conceptions of the desired characteristics of living environments are by no means unanimous, it follows that we should not expect there to be any one city size that satisfies the needs and values of all people. However, with this qualification, one can validly ask if the overall trends in our urban size distribution are in keeping with the overall trends of city size preferences; the requisites for economic efficiency; and the desired social, political, environmental, and systemic attributes of urban environments.

Historically, there was a concern for balanced urban growth in the United States as early as 1937 when the National Resources Committee published its report, Our Cities: Their Role in the National Economy. The Committee concluded that:

> The concentration of so large a proportion of the urban population in extremely limited areas is wasteful of resources, time and energy. The same would be true of undue dispersion. The Committee believes that the most desirable environment for the urban dweller and for the effective use of human and material resources is more likely to be found somewhere between these two extremes. (p. 84)

Given the rapidly increasing concentration of population since 1937, it is not surprising that the issue of "balanced" growth should be raised again. An indication of the contemporary sense of need for greater balance in our urban growth can be found in the statements of a variety of political and advisory bodies:

- Housing and Urban Development Act of 1970--

  "It is the policy of the Congress ... to provide for the development of a national urban growth policy ... [which

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consistent set of indicators for more thoroughly analyzing the impact of urban scale across a number of dimensions. This report, then, represents a first and tentative step in that process.

has as one of its major goals the] more balanced development of all areas of the nation .... The Federal Government ... must assume responsibility for the development of a national urban growth policy which shall incorporate social, economic, and other appropriate factors ..."

- National League of Cities, 1970--

  "The potentially disastrous consequences of unguided and unchecked urbanization demand unprecedented Federal action .... A national urbanization policy must include ... a specific policy for the settlement of people throughout the nation to balance the concentration of population ..."

- National Governors' Conference, 1970--

  "There should be an adoption of a National Population Growth and Distribution Policy ... to lessen the congestion, and reduce pressure, on the already overburdened resources of our cities ..."

- Agricultural Act of 1970--

  "The Congress commits itself to a sound balance between rural and urban America."

- U.S. Conference of Mayors, 1971--

  "The U.S. Conference of Mayors has strongly supported the development of a national growth policy ... such a policy should encourage a balanced population among cities, suburbs, and non-metropolitan areas ..."

- Citizens Advisory Committee on Environmental Quality, 1971--

  "... a more balanced distribution of the population should be one of the goals of our land use programs."

- The President's Task Force on Rural Development, 1970--

  "... high priority be given to a national policy on the geographic distribution of population and economic growth ..."

- Advisory Commission on Intergovernmental Relations, 1968--

  "On balance, therefore, the Commission concludes ... that there is a specific need for immediate establishment of a national policy for guiding the location and character of future urbanization ..."

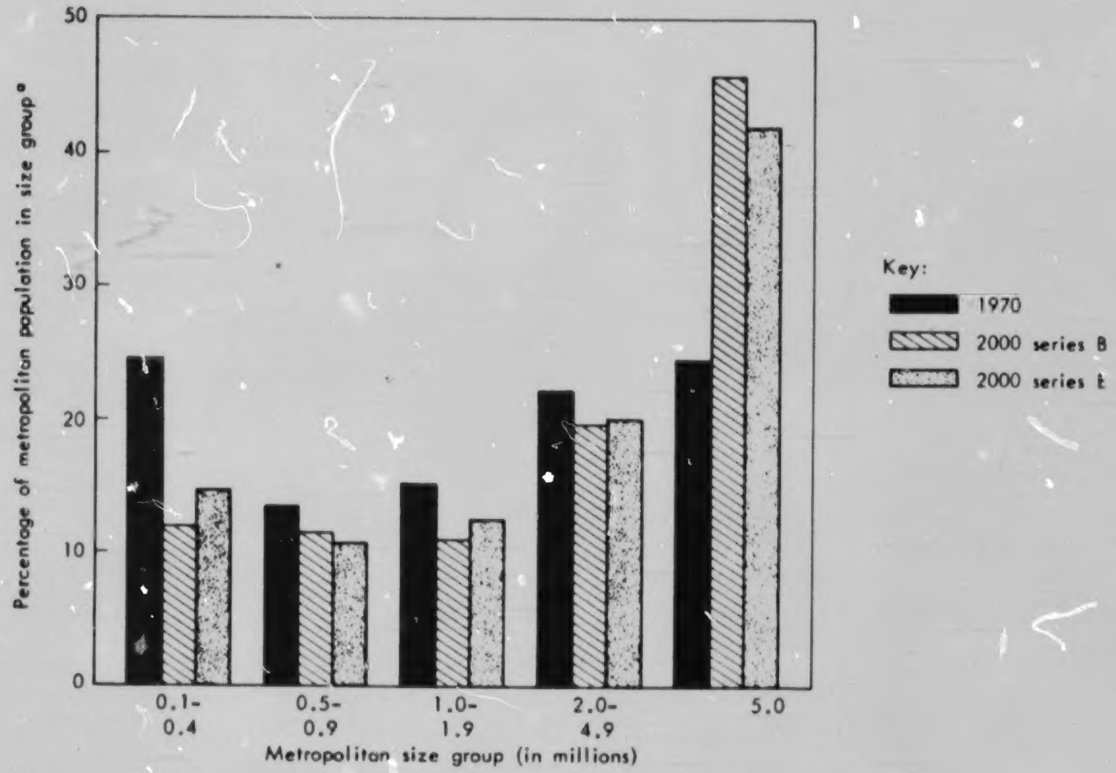
Clearly, this is a significant national issue, for any substantial policy action would have reverberations throughout our society. However, it also seems apparent that the present formulation of this issue--greater population "balance"--has little more than rhetorical utility because it informs so little when it comes time to make hard policy decisions. What is needed, then, is a more specific understanding of the dimensions of population "balance". First, however, we need a more specific frame of reference--for this we explore the apparent "imbalance" inherent in existing and projected city size trends.

Probable City Size Trends

Historically, a concomitant of the industrial revolution has been a demographic revolution manifested in the simultaneous growth of urban areas and the relative, then absolute decline of population in rural areas. The economic historian, Nathan Rosenberg, suggests (1971) that "a large part of the social, political, and economic history [illegible] the United States could be written around the bare statistical information that the proportion of the American labor force in agriculture was 63% in 1840 and 8% in 1960" (p. 72). Despite the massive transformation inherent in this rural to urban shift of our population, the distributional transformation is far from finished if we are to trust projections of future metropolitan growth. In commenting upon projected population distribution patterns to the year 2000 Pickard (1970) states that, "The [spatial] dimensions of future urban masses are almost unbelievable .... The scale of present and future urbanization lies beyond all previous American experience" (p. 151). As indicated in Figure 1, the anticipated shifts in population distribution "foreshadow a substantial concentration of population in the largest metropolitan areas--those with upwards of five million inhabitants--and a declining percentage of Americans in centers under five million" (Morrison, 1972, p. 16).

Figure 1:

Distribution of U.S. Population by Size Group, 1970 and 2000



SOURCE: Morrison (1972), p. 16, calculated from Pickard (1972).

[a] Limited to metropolitan areas ≥ 100,000 population.

Pickard's projections for the Commission on Population Growth and the American Future (1972) indicate that the most startling feature of projected population growth is the enormous increase in population living in the Great Metropolitan areas, which contain one million or more people each. Table 1 shows longitudinally the striking rapidity with which these very large urban areas have emerged--both in number of such places and in dominance as measured by the proportion of the total population that will live within them.

Table 1

TOTAL POPULATION OF GREAT METROPOLITAN
AREAS OF ONE MILLION OR MORE,
BY CENSUS YEAR 1940-2000
(Series E Projection)

Year	Number of Areas	Percent of Total Population
Actual		
1940	12	28%
1950	15	31
1960	23	38
1970	29	44
Projected		
1980	39	54
1990	40	60
2000	44	63

Source: Pickard (1972)

More specific dimensions of the growth of megapolitan regions are shown in Table 2.

Table 2

ILLUSTRATIONS OF "MEGALOPOLIS," 1970 AND 2000
(Series E Projections)

Area	Population (millions) 1970	Population (millions) 2000
New York region	18.4	22.2
Los Angeles region	10.0	18.8
Chicago region	8.1	10.4
Washington-Baltimore region	5.2	8.3
San Francisco region	4.8	7.8
Southeast Florida region	2.3	5.6

Source: Pickard (1972), p. 134, 138

A note of caution is warranted in using these data. The accuracy of these distribution projections depends upon the appropriateness of extrapolating historical trend data into the future. However, recent discontinuities in population distribution trends suggest that the future is not as certain or predictable as we might be led to believe by such forecasts. The nature and dimensions of these trend discontinuities will be discussed in a later section.

There are two distinct ways of approaching these distribution data. One approach views these trends as "natural" and "inevitable." Under this approach, one would project the distribution trends to determine the most probable future, and then see what problems arise in accommodating ourselves to that future. Since what is most likely to occur is thought to be an extension of a basically good context and process, it is therefore largely and inherently desirable. Given the probable future, the response is: how does one "accommodate," "guide," and "ease the transition" to that probable future. This model of problem formulation is consistent with what has been described as the "incrementalist approach" to policy making. Incremental policy making "... chooses those goals that draw policies forward in the light of what recent steps have shown to be probably realizable ..." (Braybrooke and Lindblom, 1963, p. 71). Further, "... Incremental policy making ... minimizes the threat of social cleavage by not raising immediate challenges to fundamental principles" (Sulzner, 1971, p. 442). As such, incremental policy making, which characterizes much if not most of our national policy processes, seems strongly tied to short run considerations and is not well adapted to long run issues, such as national population distribution.

Therefore, another model of problem formulation seems more appropriate for looking at distribution policy:

- What are the most probable distribution trends?
- What are the most desirable distribution trends?
- Differences between probable and desirable define problems.
- Then, what are the most feasible ways of resolving conflict between probable and desirable trends.

Clearly, this formulation of a distribution problem does not so quickly accept incremental extrapolation from the existing context as being necessarily good. Further, this conceptualization consciously creates the difficult but immensely useful task of explicitly stating what future trends are thought to be desirable and then contrasting them with what seem to be probable as a model for defining areas of need for policy initiatives. Consistent with this latter approach, we now turn to an examination of "desirable" city size trends.

"Desirable" City Size Trends

The basic issue addressed in this report is whether our larger urban places are becoming too large in terms of environmental, social, political, and other costs. In examining the costs and benefits of increasing urban scale we are looking at only one piece of a much larger and complex policy puzzle which falls under the rubric of national growth policy. Understanding the nature of the scale component, although necessary for the formulation of policy, is by no means sufficient for the development of that policy.

The following statements summarize very briefly the findings that emerged from the background analyses. They present only the skeletal dimensions of an admittedly partial analysis of the scale aspects and, as such, they are useful as an overview but the subsequent sections should be studied for further information.

Public Attitudes Toward City Size

- There exists a strong and pervasive preference for smaller scale living environments--typically, in national polls regarding preferred residence, an absolute majority of Americans indicated they would prefer to live in a small town or rural environment.
- There exists considerable dissatisfaction with the large urban environments relative to the small town/rural environments.
- The preference for smaller scales seems to be a long-standing one--opinion polls back to 1948 register a majority preference for smaller scales.
- These preferences are not merely nostalgic yearnings--a larger percentage of the young (under 30 years of age) now indicate a preference for smaller scales.
- These preferences are not simply a part of an American myth that views the good life as being found in the country--polls show real increases in expressed satisfaction with place of residence as scale decreases.
- These preference patterns are supported by related survey data which show that people's perception of past and expectations of future community change are most negative in the larger cities and most positive in the small towns and rural areas.

- Two state studies (in Wisconsin and Washington) suggest that, although many people prefer a smaller scale of living, they would like to live within commuting distance of a larger city.
- National preferences extend to support for a national distribution policy that would limit population growth in larger urban areas and stimulate growth in smaller towns and rural areas.

Social Consequences of Increasing City Size

- Large urban environments offer desirable social attributes for many people--economic diversity, cultural opportunities, anonymity, free expression of diverse life-styles, and opportunities for personal achievement. For others, these same environments have undesirable attributes along similar dimensions--an underlying homogeneity yielding a superficial diversity, cultural breakdown, alienation, too much competition.
- To a considerable extent, urban places are primarily economic entities in their structures and functions and, as such, larger urban places represent the further articulation of economic functions and structures. To the extent that these economic functions are maximized, it is doubtful that non-economic aspects of urban existence--i.e., social aspects--are simultaneously maximized.
- Rates of violent crime are correlated with increasing urban scale even after accounting for socioeconomic differentials between larger and smaller urban places.
- Larger scale environments seem to be premised to a greater degree upon the aesthetics of simplicity, economy, and efficiency and this, in turn, diminishes perceptual diversity.
- Larger scales are less comprehensible and more difficult to relate to. Further, their size seems to diminish the sense of relative significance of individuals.
- Larger scale urban places often allow a lesser degree of access to the natural environment since greater distances must usually be traveled to escape the urban region.
- All contemporary trends associated with the emergence of alienation are directly or indirectly tied to the growth of very large urban environments; e.g., the enlargement of

living scale beyond human comprehension, the decline of kinship ties, increased geographic mobility, increased social differentiation, and the decline of more traditional social forms.

- As the scale of social systems increases, the form of social "glue" that makes the systems cohesive changes. Family based ties in smaller urban systems give way to role-related ties in our larger urban systems as primary sources of social elasticity. The emergence of even larger scale systems may require new forms of social cohesion--highly formalized and rationalized external social controls may emerge under conditions of social stress.
- A relative absence of social pathology is not a good indicator that things are alright. Man's adaptability allows him to tolerate, and thereby mask, the warning signals of social pathology. Further, we confuse the tolerability of an environment with its desirability.

Behavioral Properties of Large Urban Systems

- Larger systems may grow to a point where they yield diminishing returns to scale--particularly when considered from an overall socioeconomic perspective; however, since we do not have the indicators to measure this expectable outcome of systems growth, we behave as if it would not occur.
- Successful systems, when premised upon plentiful resources, can become unsuccessful when premised upon scarce resources.
- The highly specialized work roles implied by the division of labor found in large urban systems may contribute to worker boredom, absenteeism, lowered productivity, and lowered product quality.
- As system size increases, interdependence increases and, in turn, vulnerability of the system to damaging perturbations increases.
- Larger systems are more complex, and that complexity makes the system less comprehensible and less amenable to effective regulation/control.
- Growth of a system creates form but that form, in turn, inhibits the nature of future growth, thereby locking us into a relatively inflexible physical form.
- Larger systems tend toward conditions of low performance.

- Large systems are generally complex and that complexity, in turn, limits the rate of effective acquisition and use of knowledge, which makes the maintenance of "relative political maturity" more difficult for all constituents in the political process.
- As effective political participation of the average citizen is diminished by lack of relative political maturity, and as the effective comprehension of highly complex issues becomes more difficult for the politician and civil servant, increasing reliance is placed upon specialist/experts--persons who are essential to the system but outside of the usual checks and balances of American political processes.
- For those who cannot specialize, given their mandated broad focus of concern (e.g., the mayor), complexity reduces the comprehensibility of the system being governed and increases the likelihood of attempting to employ simple solutions to solve difficult problems which, in turn, increases the likelihood that the system will tend towards conditions of relatively low performance.
- Large systems are generally interdependent which, in turn, implies the need for a broad focus of regulation and control. Interdependent systems are generally more vulnerable, and this reinforces the need for effective regulation and control.
- Large systems are also increasingly rigid since no part can be changed without affecting the other components of the system. Larger systems are therefore more inflexible and resistant to change.
- As scale increases, the number of constituents generally increases at a much faster rate than the number of governing officials; the result is that the amount of time an official can spend with any one person or group is proportionately diminished.
- As scale increases, the impact of any one individual upon the outcome of an election is diminished since the individual is but one among millions. The payoff to participating knowledgeably under such circumstances is small. Participation in very large systems becomes "trivial" through the media of voting; participation in the subsystems of a large system (where the individual could presumably "make a difference" since he is not overwhelmed numerically) also becomes

"trivial" since the issues are generally not of substantial significance. Large systems, then, trivialize political involvement.

City Size and Environmental Quality

- Overall, environmental quality seems to deteriorate as city size increases.
- Air pollution is strongly correlated with increasing city size.
- There is suggestive evidence that mortality rates increase as city size increases owing to increased concentration of air pollutants.
- Increased noise pollution is correlated with increasing city size.
- Increasing commuting time is correlated with increasing city size.
- Increased rates of traffic deaths are correlated with increasing city size.
- Significant man-made changes in local climate are correlated with increasing city size.
- Increased garbage collection and waste treatment costs are tentatively associated with larger city size but the cost differences relative to smaller cities are trivial.
- Changeover costs for separate sewer systems would be enormous for larger and older cities.
- Planning costs decrease with city size but the cost differences are trivial.
- Larger cities seem to be better innovators.

The Economics of City Size

- In general, economic forces seem to favor the continued growth of larger--though perhaps not the largest--urban areas.
- With respect to an individual company, economic incentives seem to be either neutral or slightly favorable to the largest urban places. Although the suburbs of large urban

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areas seem to be growing due, in some substantial part, to the movement of manufacturing employment to the urban periphery, this still contributes to the overall growth of larger urban places. Recent movement of white collar employment beyond the largest urban areas suggests that there may be some diseconomies of scale for the very largest urban places but, in general, across a large city size range, there do not seem to be substantial economic incentives which favor one particular urban size class.

- With respect to the individual employee, the larger urban places offer significant economic advantages to those most interested in developing a specialized field of professional competence and in obtaining higher economic rewards. The higher net income associated with larger urban places may, for many, compensate to some unknown degree for the disamenities of urban living.
- With respect to public sector economics, it appears that the cost of public services may generally be somewhat higher in the largest urban places. Differences in the quality of public services are difficult to estimate. Nevertheless, the higher costs of public services may be more than offset by higher incomes in larger urban environments. Overall, differences in the cost of public services seem of marginal economic significance in proportion to the average family budget.

Before drawing conclusions from the above aggregation of characteristics associated with increasing urban scale, it is useful to point out several caveats.

First, these various dimensions have different characteristics which makes cross comparisons and aggregate conclusions difficult: they have different degrees of "extensivity," "intensivity," and "remediability." For example, air pollution might be extensive (affecting a large proportion of the urban population), moderately intensive (not a great problem but rather irritating and unaesthetic), and moderately remediable (with a few pollution control measures, a significant reduction might occur). Another example, that of urban crime, might be less extensive (directly affecting only a small proportion of the population), highly intensive (for that population it presents a severe problem) and with low remediability (assuming the problem requires fundamental social-psychological change for a root solution).

Second, any aggregate conclusions that emerge are highly dependent upon an individual's sense of priorities. For example, one person may prefer a higher income and a greater quantity of goods and services to noneconomic amenities; for another person, the equation of relative priority may be reversed, with noneconomic concerns paramount.

Third, no single policy perspective, as such, is "right." Rather, a variety of policy perspectives are appropriate, depending upon the relative trade-offs which are desired.

With these caveats in mind, it yet seems possible to reach several conclusions with respect to the issue of city size and the quality of life:

(1) The size of an urban place is an important factor that can contribute to and detract from quality of life conditions; it therefore deserves a primary place in the formulation of national growth policy.

(2) In general, the quality of urban life, as measured across noneconomic dimensions, seems to decline as urban scale increases.

(3) The extent to which this quality of life difference is acceptable seems to depend largely upon economic trade-offs; the economic rewards must compensate sufficiently for the apparent net social, environmental, political, preferential, and systematic disamenities which accrue as urban scale increases; otherwise, one would expect a spontaneous reversal in migration patterns away from larger cities to occur.

An important issue emerges from the preceding discussion; namely, to what extent are people freely making trade-offs (accepting economic rewards as adequate compensation for noneconomic disamenities) and to what extent are these "forced" trade-offs? In other words, what is the nature of choice that people have with respect to the size of urban place within which they live? If they have substantial choice, then there is little rationale to justify intervention--can people, then, "vote with their feet" for living environments they prefer?

Can People Vote With Their Feet?

It is sometimes suggested that, in our highly mobile society, there is no need for a distribution policy to achieve greater population balance since, if that were what people really wanted, it would naturally emerge as a product of migration flows. Further, it is sometimes suggested that the preference polls cannot be trusted since stated preferences are so much at odds with behavioral reality--if people really did not like their present place of residence (whether for size or other reasons) they would simply "vote with their feet" and move. For several important reasons this seems to be an inaccurate and short-sighted view.

The essential question seems to be, do people really have "freedom of choice" in selecting their living environments? Certainly we are a highly mobile society, but does this freedom of movement mean that we have freedom of choice in selecting among diverse alternative living environments? Probably not for several reasons.

First, people migrate primarily in response to economic forces; they tend to be pulled to where the jobs are (Morrison, 1972). A study by the Bureau of Labor Statistics (Saben, 1964) indicates that economic motives are predominant: "Half of migrants reported work-related factors--to take a job, look for work, or make a job transfer--as reasons for their moves" (p. 876). Similarly, a study by Lansing and Meuller (1967) concluded: "... judging by people's own explanations, the decision to move among members of the labor force is strongly dominated by job-related economic reasons" (p. 66). Sundquist (1970) states the process well:

> The movement of people from smaller to larger places is, to a large extent though no one knows the exact proportions, involuntary, forced migration .... The spatial distribution of population is determined, of course, by the distribution of jobs. With the exception of the limited numbers of the self-employed and the retired, people are not in reality free to live just anywhere. The vast majority are employees who must live where there are jobs, and the location of jobs is not their choice. The concentration of the country's population is the result of employer-created job patterns that the people have had to follow. For the most part employers have not been free to create jobs just anywhere either. They have been bound by considerations of economic efficiency .... As a result, the basic pattern of population distribution has been designed by the play of economic forces, not by men acting rationally as environmental architects; events have been in the saddle once again. (p. 90)

Once economic forces have established major population centers, then net natural population increase can become an important contributor to increased urban size. Even though smaller places may grow at a faster rate than bigger places, the absolute numerical increase of the larger area can, for a long time, offset the higher growth rate of the smaller area. This suggests that because businessmen want to be close to their growing markets and because the greatest absolute increases in population are likely to be found in urban areas which are already large, then a circular mechanism emerges which feeds upon itself: people attract business and business means jobs which attract people which attracts more business, and so on. Obviously, unless there are some limiting mechanisms (pollution, crime, congestion), the self-generating momentum could go on almost indefinitely, yielding an urban area of enormous size. Thus, it would appear that while there is indeed freedom of movement, there is not a substantial degree of freedom of choice except within bounds rather tightly defined by economic circumstances.

Second, freedom of choice demands diversity. If all available choices are essentially the same, then the freedom to choose is virtually meaningless. One substantial component of diversity would surely be a diversity of city size, implying quantitatively and qualitatively different living environments. While a diversity of city size does not, by itself, ensure a diversity of living environments, it does seem to be an important precondition to such variety. However, when we study the projected city size trends, we can readily see that, for a substantial majority of the American people, this element of diversity is being rapidly eliminated. A continuation of present distribution trends will largely narrow living choices to large urban agglomerations and will eliminate a substantial component of diversity. As Dubos (1967) notes, this has important ramifications for man:

> And yet it is certain that we can exploit the richness of man's nature only if we make a deliberate effort to create as many diversified environments as possible. This may result in some loss of efficiency, but the more important goal is to provide the many kinds of soil that will permit the germination of the seeds now dormant in man's nature. (p. 20)

Third, what is true for the individual is not necessarily true for the whole--although a few people can choose to live at smaller scales, most people cannot. At present, there simply are not enough economic opportunities in smaller places to sustain population influxes. Therefore, it is not appropriate to generalize from individual options in location behavior to society as a whole.

There is yet another limitation on freedom of choice. It is useful to distinguish between being "allowed" and being "able." Being "allowed" implies the absence of external restraint. Being "able" implies the presence of opportunity and adequate resources. Since no man is really free if he lives in the kingdom of necessity, we can conclude that, theoretically, many people are "allowed" to move to smaller places (although if many people act upon this, restraints will rapidly emerge in the form of lack of job opportunity); and few people are really "able" to move to smaller places. Freedom of movement, then, cannot be construed to mean there is an equivalent degree of freedom of choice.

In spite of these rather substantial constraints which prevent people from moving to locations of their preference, it yet seems appropriate to think that there is, to some degree, freedom of choice with respect to place of residence. It is interesting to note that, despite the substantial trends which suggest that most people are compelled to move between and live within the locus of large metropolitan areas, there is a growing indication that more people are indeed voting with their feet and are moving to smaller scale living environments. One manifestation of this is the business executive who foregoes considerable increases in income in order to avoid living and/or working within New York City (*Business Week*, 1970). In addition, the fact that a substantial number of firms with white collar employment are moving out of the nation's largest cities indicates that there may be pressure to alter the heretofore consistent pattern of locating office buildings in central business districts.

A more substantial indication that people may be foregoing additional income to live in a substantially smaller scale community is the recent trends noted by Hacker (1974):

> While big cities have been fighting to rid themselves of dry rot and while the suburbs have begun to gray the faces and dreams of middle-class Americans, the small town has been luring millions of people in--or back. Almost without notice, the tide of rural-to-urban migration that characterized post-World War II America has now completely turned .... (p. 1)

Calvin Beale, who heads the Population Studies Group of the U.S. Department of Agriculture, states that:

> In the 1950s the net movement from nonmetropolitan to metropolitan areas was 5.5 million people. In the 1960s it was 2.2 million, a significant reduction .... We can't be precise about

> this, but we think that between the spring of 1970 and July 1972 the net movement from the metropolitan to the nonmetropolitan areas was 300,000 to 500,000 people. If this is so, you'd have to go back to the pre-1890 period to find anything like it .... It is not a back-to-the-farm movement. It is, in many cases, a back-to-the-country movement, with modern conveniences, and good roads and nearby small-scale urban facilities .... [The result is that since 1970] the total number of people employed in the nonmetropolitan counties began rising faster than employment in metropolitan counties. This is a major, historic turning point. (Hacker, ibid.)

This net migration away from our largest urban areas is evidence for the findings of this report; namely, that there are long-standing preferences for smaller scales of living as well as substantial reasons for those preferences along social-psychological, environmental, political, and systemic dimensions. This migration, representing a discontinuity from expected trends, suggests that an appropriate redistribution policy may find very substantial support: "... the American people seem at least potentially receptive to shifting their residences on a grand scale" (Watts and Free, 1973, p. 83).

Conclusions

Summarizing briefly, there are a number of important conclusions which emerge from the preceding analysis:

- If present distribution trends continue, much further population agglomeration can be anticipated such that, by the year 2000, nearly two-thirds of the American people will be living within Great Metropolitan Areas of one million or more people.
- Economic forces are primary causal agents in the creation of these distribution patterns, and noneconomic concerns seem only incidentally factored into the calculus which determines population location.
- The research summarized in this report indicates that, for a substantial portion of the American population--perhaps as much as an absolute majority--the trend to ever larger cities is considered undesirable as measured across a number of dimensions (social, environmental, political, and systemic).

- Further, it appears that, for a substantial number of people, the quality of urban life across noneconomic dimensions--as measured--is inversely correlated with scale of urban place.
- People have freedom of movement but that cannot be equated with freedom of choice if such choice is to include a range of city sizes as an important precondition to diversity.
- People have difficulty in "voting with their feet"--they are allowed to do so but, given economic forces which impel further agglomeration, they are seldom able to do so.
- Nonetheless, and even if in the past economic rewards have apparently provided sufficient compensation for disamenities associated with increasing scale, recent trends suggest that this may no longer be the case: a reversal away from larger metropolitan areas is occurring. The net migration from mettropolitan to nonmetropolitan areas constitutes a reversal unlike any seen in the United States since the pre-1890 period.
- Thus, there appears to be a substantial amount of latent potential and support for a national population redistribution policy aimed at greater population "balance."
- For such a national growth or distribution policy to be successful, it must deal not only with distribution patterns per se, but also with the underlying economic forces and mechanisms that create those distribution patterns.

Urban Balance in a Larger Context

There are several caveats with respect to scale that need to be addressed in order to place this important policy issue into greater perspective. First, concern for balance has typically meant a concern for excessive concentrations of people--in other words, a concern for size. However, while city size may be a necessary element, it is by no means sufficient for the construction of a national growth policy. Despite the importance of size differentials, smaller cities do not seem fundamentally different from larger cities. Scale differences do yield gradient differences along dimensions of environmental quality, political participation, a sense of community, and so on. However, scale differences do not seem to yield a radical difference in kind since both large and small cities are the products of the same underlying economic forces and mechanisms. This underlying structural homogeneity in all of our urban places, irrespective of size, means that policy makers must go beyond the city size question in formulating policy designed to create desirable living environments.

Second, our population distribution problems cannot be divorced from the overall societal context from which they arose. They are not external aberrations but rather are fundamental to the functioning of our society. As noted earlier, our huge urban areas are essentially creatures of economic forces developed for largely economic ends. Thus, there seems a direct linkage between the industrial economic order and our population distribution patterns and problems. If the nation decides that existing population distribution trends are undesirable, then any meaningful change will require dealing with the fundamental economic forces, institutions, and value premises which have given rise to the distribution patterns in the first place. Policy makers must deal directly with (1) the mechanisms creating the population distribution, and (2) the motivations which provide the direction to the mechanisms.

Third, a national growth or distribution policy demands, by its very nature, a long term planning and implementation horizon. It therefore seems critically important that such a policy initiative consider the impact of external forces which could substantially alter the future context within which such policy resides. For example:

- Energy crisis--If energy shortages reemerge as a significant U.S. problem, this could impact upon transportation mix, commuting fields, consumption and production patterns, etc. These have obvious implications for population--and goods--distribution.
- Food crisis--A world famine, whether the product of excessive populations, world climatological changes, or other forces, could substantially alter the way in which we use our water

and land resources and consequently, the location of economic activity and therefore the location of population.

- Environmental crises--We may discover that some regions of the United States are too ecologically fragile to support the massive population agglomerations that seem to be emerging and thereby be forced to redistribute population.
- Post-industrial values--The emergence of new and commonly held values which diminish the significance of the American "economic ethic" and elevate values such as a "self realization ethic" and "ecological ethic" could have important implications for the population distribution of the United States.

Such forces, if unrecognized in the planning process, could substantially affect the success of a national distribution policy. Therefore, it seems important to consider a number of such "external" factors as part of alternative future scenarios within which a distribution policy would be developed.

In conclusion, we presently have a diverse mix of seemingly unrelated policies which are haphazardly and inadvertently creating a "national distribution policy." The essential choice facing us seems to be whether we wish to continue the unconscious articulation of distribution patterns or whether we wish to plan in a more explicit fashion for development. At least along one vital dimension--that of city size--the answer seems to be affirmative in support of a more balanced and consciously planned distribution pattern.

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PUBLIC ATTITUDES TOWARD CITY SIZE

by

Duane Elgin and Sue Cox

Where do people want to live? Small town? Big city? Is this different from where they live now? Do Americans consider population distribution a serious problem in their country? Does the public support policies aimed at redistributing the population?

In 1972, the National Commission on Population Growth and the American Future conducted an extensive survey of public attitudes toward our population distribution patterns. A summary of the results of that survey, written by the staff of the Commission, stated that:

> . . . both the Commission's survey and a variety of other sources indicate that where our contemporaries live often does not coincide with where they would prefer to live . . . . Over half of our sample says they would like to live somewhere other than their present location. Over half sees population distribution as a serious and continuing problem. Over half would favor the Federal government trying to discourage the growth of large metropolitan areas and encourage the growth of small towns. Taken together, these public attitudes, at face value, certainly point to support of a population distribution policy designed so that fewer people live in large urban places and more people in small places. (Volume 5, p. 615)

Where People Want to Live

A number of opinion surveys have measured public attitudes regarding preferred places of residence (Roper, 1948; Gallup, 1966, 1969, 1970, 1971; Harris, 1970; Fuguitt, 1971; Dillman and Dobash, 1972; Watts and Free, 1973). For example, in 1966 a Gallup survey asked: "If you could live anywhere in the United States that you wanted to, would you prefer a city, suburban area, small town, or farm?" Although only approximately one-third of the sample lived in small towns and farms, nearly one-half expressed a preference for such areas as an ideal place to live. Gallup concluded that better jobs available in the bigger cities had many people "involuntarily" trapped in places they did not prefer. In 1971, the Gallup organization conducted an identical survey and found that the percentage of respondents expressing a preference for small towns and farms had risen from 49 percent in 1966 to 56 percent in 1971. Gallup interpreted this as a broadening base of potential support for programs aimed at the revitalization of smaller scale living environments (Reported in Population Commission, Volume 5, p. 603).

The most searching national survey of this topic to date was conducted for the Commission on Population Growth and the American Future. Table A-1, from the Commission survey, confirms the patterns of preference identified in the Gallup polls. In 1972, an absolute majority of the sample population (53 percent) expressed a preference for a rural or small town place of residence. One-third indicated a preference for a small urban environment and only 13 percent expressed a preference for a large urban environment as a place of residence. These are striking patterns of preference in that they are so much at odds with the actuality of present distribtuion patterns. A close look at the survey results indicates that these preferences are relatively invariant even when differences in income, education, age, and region of present residence are taken into account. This, in turn, suggests that the preference for smaller scale living environments is pervasive and deeply rooted, for it consistently emerges across so many socio-economic-geographic boundaries.

The greatest deviation from this consistent pattern of preference for a smaller scale emerged when preferences were related to scale of present place of residence, and race. Table A-1 shows the black population nearly evenly divided in its preference for the three scales of living environments. Perhaps this reflects recent memories in rural poverty and thereby diminishes the attractiveness of the smaller community for the black relative to the white person.

Table A-1

RESPONSES TO SURVEY QUESTION, "WHERE WOULD YOU PREFER TO LIVE?"--1972

	Rural or Small Town	Small Urban	Large Urban	No Opinion
National	53%	33%	13%	1%
Residence				
Rural or small town	88	10	2	--
Small urban	39	55	6	--
Large urban	34	26	39	2
Region				
Northeast	58	28	14	--
South	57	30	12	--
North Central	46	37	17	--
West	50	38	12	--
Age				
Under 30 years	56	28	15	--
30 years and over	52	34	13	1
Color				
White	54	33	11	--
Black	33	34	33	--
Education				
Less than high school	57	30	12	1
High school complete	54	32	13	1
Some college	47	38	14	1
College complete	40	38	22	
Income				
Under $5,000	57	32	10	1
$5,000 to $9,999	53	34	12	--
$10,000 to $14,999	45	29	11	--
$15,000 or more	45	34	21	--

Note: Rural or small town includes the farm, open country, or small town responses. Small urban represents small city, or medium size city and suburb. Large urban includes the large city and its suburbs.

Source: Population Commission, p. 605 (1972)

Place of current residence also accounted for a significant deviation from typical preferences for smaller scales. This is not surprising if one assumes that people currently reside in an urban scale of their own choosing and their choice reflects what they like. In a highly mobile society, it would seem plausible to expect people to prefer to live where they now live. However, there is a marked decrease in satisfaction with present place of residence as urban scale increases:

- 88 percent of "rural and small town" people prefer where they live.
- 55 percent of "small urban" people prefer where they live.
- 39 percent of "large urban" people prefer where they live.

There does seem to be a consistent pattern of increasing dissatisfaction with present place of residence as scale increases:

> Thus, many Americans at least register a desire to live somewhere else; and more often than not, that somewhere is a small town or rural area. This preference is particularly strong for those people now living in these rural or small-town areas, but it is shared by much of our metropolitan population. (Population Commission, Volume 5, p. 606)

The same findings were confirmed by a survey reported in State of the Nation (Watts and Free, 1973). Respondents were asked to classify the type of place in which they now live and then specify the kind of locale they would choose if they could live anywhere they wished. The figures in Table A-2, according to Watts and Free:

> . . . suggest that if the American people could follow their inclinations, the population of our cities would be cut in half. The proportion of suburbanites would remain the same. The percentage of people living in towns and villages would increase significantly. And the proportion enjoying country life would more than double, from less than two in ten to almost four in ten. (p. 81).

Table A-2

CONTRASTS BETWEEN PRESENT AND PREFERRED LOCATION OF RESIDENCE

Scale	Present Location	Preferred Location
City	36%	18%
Suburb	22	22
Town or village	15	19
Rural area	18	38
Don't know	9	3

Source: Watts and Free (1973), p. 81.

It might be suggested that these findings merely reflect a nostalgic yearning for simpler times or a manifestation of the old idea that true happiness is to be found in the country--close to nature. Although this may well be part of the American myth, it also seems to be true for many people. Watts and Free cross-correlated present places of residence with preferred places of residence to see who was most happy and where:

> . . . [the data] show that, while four out of ten present city dwellers want to stay in the city, no less than nine out of ten of those now residing in the country say they are just where they want to be. (p. 81)

This survey tends to cast doubt upon nostalgia as an adequate explanation of the strong preference for rural and semirural living environments. If nostalgia were the cause, then the younger respondents, who are predominantly urban-born and urban-bred, should manifest preference levels below that of their elders who can remember their non-urban origins. The Watts and Free survey found that:

> . . . significant in terms of any future redistribution of the population are the views of the young. If left to their own devices, large numbers of young people would move out of the cities, not to be suburbs, but to towns, villages, and especially, rural areas, where considerably more than four out of ten said they would most like to live. (p. 83)

This finding is consistent with the Population Commission's poll (see Table A-1) which found that slightly more persons under the age of 30 (56 percent) would prefer to live in a rural setting than those over the age of 30 (52 percent).

The Dynamics of Preference Change

Table A-3 provides a small glimpse into the dynamics of city size preferences. It must be cautioned that this table provides only a rough estimate of longtitudinal trends, since it is constructed from a somewhat arbitrary grouping of not strictly comparable poll data. With these caveats in mind, it is interesting to note that over the period of more than two decades (from 1948 to 1970), the absolute preference for smaller scales (small city, small town, country) never drops more than slightly below 50 percent. This would suggest a strong and continuing preference for smaller scales of living even while sub-currents of preference change were occurring.

A discernable change in the patterns of preference is the drop in preference for "smaller scales" from 1948 to 1966 and then the subsequent increase in preference for smaller scales for from 1966 to 1970. Conversely, the preference for "large places" was a relatively low 34 percent in the 1948 poll, rising to 50 percent in the 1966 poll and then falling to 44 percent in the 1970 poll. One might infer from the foregoing that although there was a post-World War II trend which tended to favor the growth of larger cities, this trend has subsequently reversed.

Table A-3

APPROXIMATED TREND IN CITY SIZE PREFERENCE--1948-1970

Where would you prefer to live?	Roper Poll* 1948	Gallup Polls 1966	Gallup Polls 1970
City	16%	22%	18%
Suburb	20	28	26
Total, "large scale"	36%	50%	44%
Small town	41	31	31
Farm	24	18	24
Total, "small scale"	65%	49%	55%
No opinion	0	1	1

---

* To make the Roper data more comparable to the Gallup data, the two Roper poll categories of "small town" and "small city" were collapsed into one category--that of "small town." In the Roper poll, approximately 20 percent preferred the small town and 21 percent preferred the small city.

Sources: 1948 Roper Poll cited in: E. S. Lee et al., p. 34 (June 1971). Gallup poll data obtained from the Gallup Poll organization in Princeton, New Jersey; also, see the Report of the Population Commission (Volume V, p. 604) (1972)

Attitudes Toward Population Redistribution Policy

The recent legislative interest in national growth policies seems congruent with a fairly high degree of public support for various measures designed to achieve a redistribution of the population. The opinions expressed below are drawn from the national survey done for the Population Commission (Volume 5, 1972).

- "Do you feel the population distribution is a serious problem, a problem but not so serious, or no problem at all?" (p. 610)

  - serious: 54%
  - not so serious: 30%
  - not a problem at all: 9%
  - no opinion: 7%

- "Do you think the Federal government should discourage or should not discourage further growth of large metropolitan areas?" (p. 614)

  - should: 52%
  - should not: 33%
  - no opinion: 15%

- "Do you feel the Federal government should or should not try to encourage people and industry to move to smaller cities and towns?" (p. 614)

  - should: 58%
  - should not: 33%
  - no opinion: 9%

The Commission also found:

> . . . a clear positive relationship between increasing education and higher levels of support for moderating the growth of certain large metropolitan areas. Among those without a high school diploma, only 43 percent supported such action; but support increased to 64 percent for college graduates. A comparable situation exists with regard to increasing income. (p. 613)

This finding suggests that the "good life" for those with higher levels of income and education is increasingly associated with a smaller scale living environment.

With respect to population redistrubtion policies, the Commission concludes that:

> Many people would evidently be prone to endorse a dual Federal program designed not only to discourage the growth of big metropolitan areas, but also to revitalize smaller communities. (p. 613)

Related Survey Data

A way of inferentially testing scale preferences is to examine perceptions of "quality of life" as a function of urban scale. Findings from a survey conducted by Louis-Harris (1970) are presented in Tables A-4 and A-5. The following conclusions can be drawn from them:

- Relative to the recent past, a net 24 percent of the respondents living in cities thought their community was not as good today as it was a few years ago; the reponse of the rural dweller was quite different, with a net 25 percent of the respondents stating that their community was better today than a few years ago.
- Relative to the future, only those people living in cities expected a net change for the worse (minus 5 percent) in their community over the next few years. There was a substantial net expectation of improvement (plus 20 percent) among the respondents living in towns and rural areas; and in the suburban areas, as many people thought things would get worse as better.

These data confirm the findings discussed earlier; namely, that highest levels of present satisfaction (as well as anticipated improvement) in the "quality of life" are found among people at present living in small towns and rural areas.

State Surveys

Studies of scale preferences in two states, Wisconsin and Washington, added the question of desired proximity to a large city center in an attempt to further clarify the nature of scale preferences. While it is debatable whether the urban circumstances and attitudes in these two states are representative nationally, they do offer further insights into the nature of scale preferences.

Table A-4

COMMUNITY COMPARED TO A FEW YEARS AGO*

Residents of	About the Same Today	Better Today	Not as Good Today	Not Sure	Better Minus Not as Good
Cities	29%	22%	46%	3%	-24%
Suburbs	47	22	28	3	-6
Towns	44	34	19	3	+15
Rural	46	39	14	1	+25

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[*] Sample drawn from people who lived in community more than one year; these account for 90 percent of the total sample.

Source: Louis-Harris, p. 9 (1970)

Table A-5

EXPECTED CHANGE IN COMMUNITY OVER NEXT FEW YEARS*

Residents of	Same	Better	Worse	Better Minus Worse
Cities	25%	29%	34%	-5%
Suburbs	39	26	26	0
Towns	39	38	18	20
Rural	42	36	15	25

---

[*] Sample drawn from people who lived in community more than one year; these account for 90 percent of the total sample.

Source: Louis-Harris, p. 9 (1970)

The Wisconsin study (Zuiches and Fuguitt, 1972), like the Gallup surveys, found that a high proportion of people (61 percent) wanted to live in rural areas and small towns. However, only 24 percent preferred that their residence be located more than 30 miles from a large city: the location most preferred was a rural setting within commuting distance of a large city.

The Washington state study (Dillman and Dobash, 1972) also found that a high percentage of respondents (64 percent) would prefer semi-urban, semi-rural, and rural places of residence. When asked where they would like to live in relation to a city, 46.5 percent said they wanted to be outside of the city limits but within a 15-minute drive of the city. The study also found that:

- The tendency to want to live in their present size of community decreased as its size increased.
- About 4 out of 10 city dwellers would prefer living outside the city limits, while only 1 out of 10 rural dwellers would prefer to move within the city limits.
- Public opinion favors population redistribution--majorities favored redistribution efforts by the government but this had a relatively low priority compared with other concerns (e.g., crime, pollution).

It must be cautioned that Wisconsin and Washington are not the most densely populated states and they are less urbanized than the nation as a whole. The value placed on relative proximity to an urban area in Wisconsin and Washington could well be very different if the urban center were for example, in New York, New Jersey, or California.

Conclusions

The following conclusions emerge with respect to stated public preferences for scale of living environment.

- There exists a strong and pervasive preference for smaller scale living environments--usually an absolute majority indicate they would prefer to live in a small town or rural environment.
- There exists considerable dissatisfaction with large urban environments relative to small town/rural environments.
- The preference for smaller scales seems to be a long-standing one--opinion polls back to 1948 register a majority preference for smaller scales.
- These preferences are not simply nostalgic yearnings--a larger percentage of the young (under 30 years of age) indicate a preference for smaller scales.
- These preferences are not simply a part of any American myth that views the good life as being found in the country--the polls showed markedly increasing satisfaction with place of residence as scales decreased.
- These preference patterns are supported by related survey data which show that people's perceptions of past and expectations of future community change are most negative in the larger city and most positive in the small town/rural areas.
- Two localized studies in the states of Wisconsin and Washington suggest that, although many people prefer a smaller scale of living, they would like to live within commuting distance of a larger city.
- These preferences also extend to support for a national distribution policy that would limit population growth in larger urban areas and stimulate growth in smaller towns/rural areas.

Many Americans do not seem to like present distribution trends, and they seem to think something should be done about them:

> . . . the American people seem at least potentially receptive to shifting residences on a grand scale. And their readiness to do so might be substantially enhanced if appropriate incentives and encouragement were provided through private initiatives and federal, state, and local government efforts. (Watts and Free, p. 83, 1973)

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ENIEL MISSION

SOCIAL CONSEQUENCES OF INCREASING CITY SIZE

by

Duane Elgin

It is difficult to generalize about the social attributes of large urban environments. The visceral predisposition of an individual often seems to be the final arbiter on this topic, no matter what empirical data and logical arguments might suggest. To many, our large urban places offer an amazing diversity of jobs, opportunities, goods and services, entertainment possibilities, and people-types; to others, there is an underlying homogeneity yielding only a superficial variety. Some people view the larger city as the culmination of our industrial culture; to others, our larger cities are the places where the "breakdown of society" is most evident. To some, our larger cities offer anonymity and free expression of diverse life-styles; to others they offer alienation. To some, they provide opportunities for personal achievement; for others, they seem too competitive, too cold, and lacking in love.

We do not attempt to dispute this spectrum of opinion. However, returning to the basic purposes of this study, we believe the current population distribution trends are strongly in favor of those who prefer larger urban environments--the fundamental question then arises: for those who prefer smaller scales of living (and this may well be an absolute majority of the American people if we are to trust their stated preferences), is there compelling evidence which would support policies designed to redistribute some proportion of the total population in favor of smaller places? We turn to that question.

The Economic Character of the Modern City

Our urban areas are first and foremost economic entities.* John K. Galbraith (1971) notes that after the industrial revolution began:

> ... the city ceased to be a reflection of individual, dynastic or collective personality; it became both the instrument, and the result, of industrial development. Land use was no longer subordinate, even imperfectly, to overall design. It was either that which served economic performance or what resulted from economic development. It was not what best served amenity or beauty but what best served economic efficiency. (p. 25)

Since no species encounters in any given habitat the optimum conditions for all of its functions, it would seem plausible that the social-psychological aspects of urban existence could be less than well served. Indeed, it would be surprising to find many non-economic needs being well met in our large industrial cities that are economic creatures both in their primary functions and in the market processes that structure the development of those cities. This is not to say that many social needs are not fulfilled in our cities--we know that they are. However, the fulfillment of those needs seems to be as much in spite of rather than because of the way in which our urban places have been created; and, as such, the fulfillment is perhaps greater testimony to the adaptability of man than to the creative/social design of our urban places.

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*The extent to which economic forces govern is illustrated in basic urban models like Ira Lowry's A Model of Metropolis (RAND Corporation, RM-4035-RC, August 1964) which can explain much of the pattern of population distribution through the use of "efficiency variables"--in this case, air-line distance from residence to place of employment. Lowry's simple model was able to account for a majority of the observed population distribution for Pittsburgh. This is indicative of the extent to which measures of economic efficiency rather than "quality of life" describe existing urban patterns.

To explore the mismatch between the economic character of our urban environments and the non-economic needs of individuals, it is useful to recall that the individual has been paramount in the explicit statements of the American tradition. This is reflected, for example, in the report of the Eisenhower Commission on National Goals (1960):

> The paramount goal of the United States was set long ago. It is to guard the rights of the individual, to ensure his development, and to enlarge his opportunity .... Our enduring aim is to build a nation ... in which every human being shall be free to develop his capacities to the fullest .... The status of the individual must remain our primary concern. All our institutions--political, social, and economic--must further enhance the dignity of the citizen, promote the maximum development of his capabilities, stimulate their responsible exercise and widen the range and effectiveness of opportunities for individual choice. (pp. 1,3)

Furthermore, the needs of the individual are not constant but, rather, are fluid and dynamic. The social-psychologist, Clare Graves (1970), states that the growing human being engages in an "unfolding process" marked by:

> ... the progressive subordination of older behavioral systems to newer, higher order behavior systems. The mature man tends normally to change his psychology as the conditions of his existence change. Each successive stage or level is a state of equilibrium. When a person is in one of the states of equilibrium, he has a psychology which is particular to that state. (p. 133)

Thus, individuals seem to have a dynamic hierarchy of needs, values, and beliefs such that "lower-level" (more basic) needs take precedence over "higher-level" needs. For example, frustration of lower-level needs, such as hunger, reduces the importance of higher level needs. However, conversely, when lower level needs are relatively well satisfied, higher level needs become more important. The implications of this hierarchical structure of needs are of profound importance. This implies, for example, that government programs which successfully erase poverty and hunger in a given population will result in the emergence of higher level needs rather than in a general reduction of needs. It further implies that with increasing affluence, people will move from needs which are primarily economically based (security/survival) to needs with substantial non-economic components (belongingness/esteem/self-actualization).

If our urban areas are primarily economic entities, and if the need levels of urban dwellers have risen to a point where non-economic concerns are becoming increasingly important, then it would seem plausible to suggest that there is a real and growing mismatch between the continuing economic character of urban living environments and the increasingly non-economic needs of the people who inhabit those environments. The consequences of such mismatch are described by Lang and Moleski (1973):

> ... if the environment is unresponsive to human needs, then it will be unused if potential users have a choice. If no choice is available, then a stressful situation will be created. This stress can be either physiological or psychological, depending on the need being frustrated. (p. 47)

If a primary cause of contemporary social unease with our urban environments is their creation largely as a by-product of the economic imperatives of industrialization, what then is the plausible remedy? We have, for too long, trusted the control of our urban form to the workings of the free market. Only now are we learning the central weakness of the market system: the market has no inherent direction, no internal goal other than to satisfy the forces of supply and demand. With increasing abundance, the urban dweller tends to be forced by the market system to direct his activities into accustomed economic channels. Robert Heilbroner (1968) notes that "... the danger exists that the market system, in an environment of genuine abundance, may become an instrument which liberates man from real want only to enslave him to purposes for which it is increasingly difficult to find social and moral justification" (p. 631).

To cope with the problem of urban form it appears that we must create a new relationship between the economic aspects of existence and human life in its totality.

A Digression--Population Density

Before addressing the social-psychological attributes of large-scale urban environments, it is useful to consider the issue of population density, which is oftentimes confused with scale or size. Large scales and high density need not be correlated. For example, New York and Los Angeles--both of large scale--have much different levels of population density and distinct social differences. Nonetheless, since scale and density are often related in the minds of many policy-makers, it seems useful to note representative literature dealing with the issue of density.

To date, most analytical studies of the social-psychological effects of different population densities have been largely inconclusive in establishing any significant causal relationship between the incidence of pathology and density. Schmitt (1966) found that overcrowding had no substantial impact on various measures of mortality and morbidity once socioeconomic variables were statistically controlled. When some correlations between density and social pathology (e.g., health, divorce, crime) were found, the analysis could be discounted for policy relevance since correlation does not ensure causality. Zlutnick (1971) concluded that, "we just cannot be confident about the effects of crowding on social and psychological behavior in humans" (p. 7). Mitchell (1971), in a study of Hong Kong, one of the most densely populated cities in the world, concluded that high density living situations seem to have a negligible effect on individuals and families. Freedman (1972), in a study of density as correlated with delinquency and mental illness in New York City, concluded that when other variables are controlled (e.g., income and race), density explains virtually no additional variance in juvenile delinquency and a small but appreciable amount in mental illness.

Contrasting with these studies which attribute little social significance to crowding are others which strongly suggest that density is an important variable in considering the pattern of social behavior in urban places. For example, Schmid (1960) found correlations between high population density areas and high crime rates for both juveniles and adults. Calhoun (1962) has presented experimental data which link population density and aggressive, conflict-oriented behavior in rats: the inference is that humans may respond in a similar fashion. Studies by Lansing, et al. (1970) suggest that as density increases, the need for social insulation increases correspondingly. There is a striking inverse relationship between density and knowing one's neighbors by name: "... it may be that the state of anonymity in the denser micro-neighborhoods reflects a desire for insulation from one's neighbors ..." [illegible] 109). Galle, et al. (1972), in a study of Chicago, found that four different components of population density (e.g., the number of persons per room, the number of rooms per housing unit) were significantly correlated with asocial, aggressive behavior, even when ethnicity and social class were controlled. They concluded that: "... overcrowding may have a serious impact on human behavior and social scientists should consider overcrowding when attempting to explain a wide range of pathological behaviors" (p. 29).

The conflicting conclusions from these studies suggest an overall inconclusiveness which may be due, in part, to the crudeness of the measurement processes. For example, the quality and character of a living environment is dependent upon much more than the square feet of floor space per person. Density measures extract much of the richness, diversity, and complexity out of the life experience, leaving only the variable of spatial dimension as a crude approximation. Metaphorically, the use of density measures to study social pathology may be like inferring the personality of a person from his telephone number. Given the imprecision of such measures, it is not surprising that significant results have not emerged.

Social Pathology

An important indicator of the quality of life within an urban area is the incidence of social pathologies, e.g., violent crime, divorce, mental illness, suicide, and alcoholism. Although some suggest these pathological manifestations of cultural disintegration are increasing exponentially in our major cities (see the Ecologist, January 1972, p. 31), there are few data to confirm or deny this contention. Perhaps the most extensive data available relate to the incidence of violent crime as a function of city size. The recent HEW report, Social Indicators (1974), found that violent crime increases strikingly as city size increases (see Table B-1). Although it is clear that the reported rates for violent crimes are increasing dramatically for communities of all sizes, the highest incidence of violent crime is in the metropolitan areas of more than 250,000 people. Indeed, in 1972, the rate of violent crimes in cities of over 250,000 people was nearly five times the prevailing rate within rural areas. Even these data may substantially understate the actual differences in crime rates between large and small communities. A recent study conducted by the Law Enforcement Assistance Administration (1974) found that crime in the nation's five largest cities is two to five times as high as police figures show.

An admittedly partial but nonetheless plausible explanation of these differential crime rates may be that as an urban place expands in size, order depends increasingly upon external and formal controls (e.g., laws, the threat of criminal prosecution) rather than upon more internal and informal controls such as conformity exacted by adherence to custom. In

Table B-1

REPORTED RATES OF VIOLENT CRIME, BY SIZE OF COMMUNITY
1960-1972
(Rate per 100,000 Population)

	Community Size					
Year	Under 10,000 Population	10,000 to 25,000 Population	25,000 to 50,000 Population	50,000 to 100,000 Population	100,000 to 250,000 Population	Over 250,000 Population
1960	47.7	57.3	70.1	104.4	154.0	293.7
1961	48.1	57.1	73.3	110.3	153.3	346.8
1962	42.2	56.4	69.5	102.7	162.6	361.9
1963	46.4	58.9	75.6	113.6	179.5	359.9
1964	56.7	70.4	91.5	129.9	223.3	393.7
1965	80.8	93.2	113.0	145.4	241.7	409.6
1966	86.8	101.5	128.1	160.3	261.9	505.1
1967	98.4	115.3	141.0	184.7	287.9	626.4
1968	111.4	126.6	150.8	220.5	325.3	773.2
1969	108.6	135.7	173.9	231.8	358.5	859.7
1970	141.4	159.2	214.4	273.5	450.3	980.4
1971	170.8	187.6	242.8	299.8	503.3	1,047.5
1972	203.8	199.8	267.3	322.5	502.3	998.6

Source: Federal Bureau of Investigation, Uniform Crime Reports for the United States, annual issues, 1960-1972 our larger urban environments, many people seem to have lost the powerful internal/informal sanctions of personal contact (due in part to high rates of population mobility) and custom (due in part to the rapid rates of social change associated with economic changes that have torn us loose from more traditional social moorings). A price we are paying for our economic progress seems to be social systems that do not effectively socialize their members--and when the enculturation process weakens, criminal acts may be a primary manifestation:

> By causing the disintegration of a society, by overloading the social system with too many people, or by increasing mobility so as to prevent their proper socialization, one is reducing the power of public opinion, and thereby the society's capacity for self-regulation. We are introducing asystemic controls in ever greater quantities: more politicians, more bureaucrats, more laws, more tribunals, so one is rendering the systemic controls ever more redundant, and further reducing a society's capacity for self-regulation. (Ecologist, 1972, p. 35)

It is interesting to consider Aristotle's dictum that "men come together in cities for security; they stay together for the good life." These crime statistics show that our larger cities are no longer a place to come together for purposes of finding security. Further, if people are to be taken at their word in the opinion pools, then a majority of the American people do not perceive the "good life" as being found in the larger cities. Perhaps the compelling attribute of urban living for many people is that large cities are good places for making a living. Since there can be no life without the material means of life, people choose to exist where they can ensure their material existence. Perhaps many people are trading their preferences for security and the good life for their necessity to make a living. If so, and if the American economic ethic begins to wane, there could well be a dramatic and spontaneous reversal in population distribution trends.

Perceptual/Aesthetic Aspects

Our urban environments are media which daily communicate messages to us. After living in such environments--many people for entire lifetimes--we may become hardened and oblivious to the messages they communicate. Yet the messages are still there, creating a perceptual gestalt which influences our view of the world much more than we might realize. Parr (1965) states that:

> Every thought and feeling we experience leaves its traces on our personality. If enduring features of our surroundings provoke steadily predominant moods or frequently repeated emotional responses, the conclusion seems inescapable that the environment itself may be a major determinant of personality. (p. 82)

Rene Dubos (1968) pursues a similar theme:

> The environment men create through their wants becomes a mirror that reflects their civilization; more importantly it also constitutes a book in which is written the formula of life that they communicate to others and transmit to succeeding generations. The characteristics of the environment are therefore of importance not only because they affect the comfort and quality of present-day life, but even more because they condition the development of young people and thereby of society .... (p. 171)

In the countryside, a farmhouse is only one object in a much larger landscape. "In an urban environment all spaces are enclosed, and the exterior aspects of the buildings form the interiors of the cityscape" (Parr, op. cit., p. 73). What we see and interact with is that which man has created--and our massive artificial living environments become both the figurative and literal concretizing of our reality perceptions. We mentally organize reality into "meaning frameworks" which in turn form the basis for the physical construction of reality which, in turn, provides the basis for perceiving reality. Given the extent to which our constructed environments can influence our perceptions, it would seem wise to enquire as to the perceptual appropriateness of our creations.

As noted earlier, the form of our urban environments has been premised largely upon economic criteria:

> It was not what best served amenity or beauty but what best served economic efficiency .... The aesthetic consequences of this conception of the city were uniformly disastrous.
> (Galbraith, 1970, p. 26)

Although the resulting environment is well suited for economic pursuits, it seems plausible that it is poorly suited for realizing aesthetic dimensions. At a minimum, the aesthetics of an urban place are dependent upon at least two factors:

- The isolated components of the urban place--the single residence or single office building has often been designed in a way consistent with an economic rationale. The stylistic criteria of such modern architecture is "simplicity, economy, and efficiency" (Parr, 1965, p. 71). Many laymen miss an aesthetic quality about such architecture, which may reflect a true organic need for perceptual stimulation beyond the repetitive sterility of building design consistently translated through an economic calculus. The apparent "diversity" of our structures seems primarily a diversity of quantity, specialization, and differentiation of economic function rather than any substantial qualitative diversity.
- The collection of these components into an organic whole--this aspect of cities has also been subjected to the dictates of the market place. It is difficult to conceive of an aesthetically pleasing result being the consequence:

  > ... it is as idle to expect a well-planned town to result from the independent activities of isolated speculators as it would be to expect a satisfactory picture to result if each separate square inch were painted by an independent artist. No "invisible hand" can be relied on to produce a good arrangement of the whole from a combination of separate treatment of the parts. (Pigou, 1932)

As we become an increasingly urban nation with future generations destined to be the products of our urban environments, we need be concerned as to the consequences of this perceptual/aesthetic impoverishment:

> It would seem logical to assume that just as our bodies need food and exercise to grow strong and healthy, so does our brain need an adequate sensory intake and stimulation for its optimum development. And the measure of our perceptual diet is obviously not how much we perceive, but how many significantly different images our senses transmit to our minds--in other words, the diversity rather than the repetitive quantity of our experiences. (Parr, 1965, pp. 73-74)

The lack of perceptual diversity is magnified by the loss of "imported" diversity to our urban places via in-migration from rural areas. Whereas in the past our urban places have grown with a substantial influx of people with rural origins, this migration stream is now a relative trickle. To the extent we cannot maintain an element of perceptual diversity in our urban places by drawing upon those people with rural origins, our future generations will derive from those who have been urban-bred and urban-born. Some of the perceptual attributes more common to the rural and semi-rural resident that might be lost in this demographic revolution are:

- A sense of proportion and perspective--in a relatively rural setting, where one has proximity to and identification with the natural environment, there is not the sense that man has created all; rather, man is more a co-equal agent in the biosphere and views himself in a more cooperative rather than mastering role.
- A different sense of time--given the attention to seasonality, planting, and harvest, time is more cyclical in the rural environment whereas in the more open-ended extension of activities in the urban environment, time is more linear.
- Different qualities of work--in the rural setting, work brings immediate, personal contact with the objective world; in the urban setting, work brings little contact with the objective world, the experience of which gained in large part through secondary sources of information (television, newspapers, books).
- A different sense of personal significance--in the rural environment, a person is one among a relatively few whereas in the large urban environment, a person is one among many. In subtle but significant ways, these different proportionalities seem to alter a person's perception of his significance.

This partial description of perceptual differences between large and small scale settings is not meant to validate the goodness of one or the other. Rather, its utility is in recognizing the relative uniqueness of "rural" perceptual attributes in a society that is becoming increasingly urban--particularly since these are qualities that the American people have not relinquished willingly:

> Whatever changes the American people seem to be seeking, they are not directed toward the enhancement of the facilities that lead to an urban or citified life, but rather to the introduction into the city of qualities associated with the rural life--whether trees, cleaner air and water, larger parks, or new family style dwelling to reduce the overall density of population. (Elazar, 1966, p. 46)

By changing the perceptual attributes of our living environments, we are profoundly changing the way in which man views the world and, thereby, we are surely changing man himself. Since it is doubtful that these perceptual qualities were given up with full consciousness and intention, it would seem wise to remember them in our planning processes before we are too distant from our rural origins. With such remembrance, we can then consciously integrate those perceptual characteristics we value into future living environments.

Finally, increases in urban scale decrease the proximity to the rural and natural environment. Much greater distances must be travelled from city to countryside. Experience of the more natural environment is thus for many not a daily event but, at best, an infrequent experience. The energy crisis and ensuing travel restrictions made real the possibility that our urban regions could become perceptual islands of stranded people. Simultaneously, many city people are trying to "get away from it all" and in doing so create an urban microcosm in the wilds--with traffic jams and air pollution on the way, and once there, with flush toilets, running water, power hook-ups, a concrete slab for your camper (which has many of the conveniences of the urban home) and sufficient crowding to enjoy--perhaps unwillingly--your neighbor's television if you forgot to bring the portable model along.

Alienation

The creation of a radically artificial living environment may be associated with man's present alienation from traditional sources of meaning, e.g., a keen sense of natural environment and the universe. In the urban setting of the scales that are now emerging, there is the pervasive sense that all around himself, there is only that which man has created. Perhaps this could yield an arrogance of power which explains some of the current despoliation of the natural environment. It could also yield a sense of lost connections with significant roots of existence.

> The intricate and complex processes of industrialization which led to a segmentation, specialization and "rationalization" of institutions also eroded the beliefs in a cosmological order of traditional societies .... Contemporary man no longer "naturally" sees himself as a useful and necessary member of a social whole geared into a meaningful plan of existence within the totality of a cosmic or divine order.
>
> (Luckman, 1970, p. 584)

If a person has few criteria for giving meaning to life beyond the secular rules of the industrial dynamic, then it would seem increasingly difficult for him to find meaning in the urban environment--to sort out the durable from the ephemeral, the significant from the trivial. There are many "signs" of significance and meaning (e.g., if it's large and complex, then it must be significant), but there are few contemporary "symbols" which give a deeper sense of relative importance to the various components of our complex environment. Under such circumstances, it would seem rational for people to fall back upon "smaller life worlds" which are less imposing, less complex, less extensive, and thereby more comprehensible. Thus, to make our life worlds comprehensible (particularly in the context of large urban environments), we must make our life worlds small--and in making them small we may further sever our connection of congruence and "wholeness" with the world in which we live.

This logic suggests that the emergence of massive urban environments may have substantially increased human alienation. Although "alienation" is a fluid and much abused term, the essential notion has been remarkably durable and thus must have some degree of experiential validity even if its definition lacks empirical rigor. Alienation may be defined as some combination of the following characteristics (Seeman, 1972):

- A sense of powerlessness
- A sense of meaninglessness
- A sense of normlessness
- A sense of self-estrangement
- A sense of social isolation.

That the notion of alienation has some basis in the real world seems confirmed, for example, by a recent Louis-Harris poll. As Table B-2 shows, disturbingly large proportions of Americans are distrustful of the men and institutions that shape our society and feel disconnected from the political process through which they might be able to change things.

Seeman (1972) postulates five historical trends which may form the causal basis for the emergence of alienation. It is useful to note that all of these trends are directly or indirectly tied to the emergence of very large urban environments:

(1) The enlargement of scale, referring to the fact that the bases of action and the stage of existence has become massive: big cities which embrace big governments, big corporations, big unions, etc.

(2) The decline of kinship as an important criterion of place, with consequent increase of anonymity and impersonality in social relations.

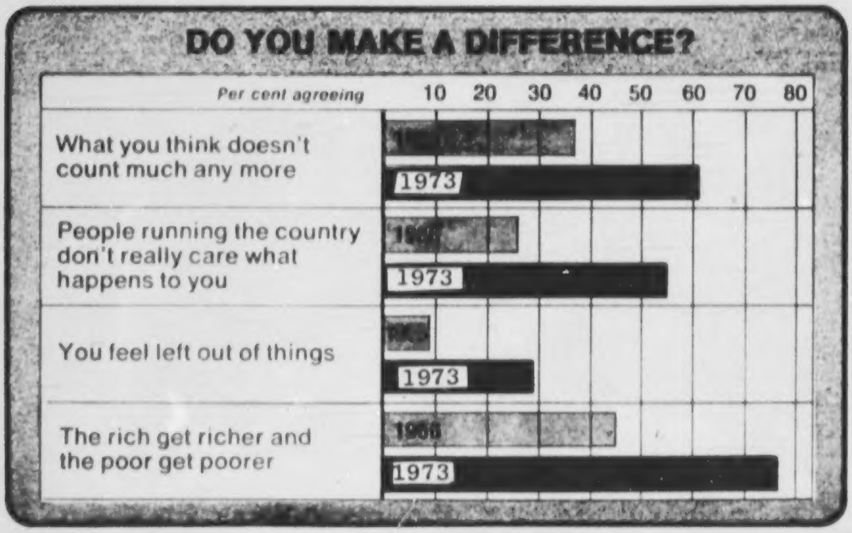
(3) Increased mobility, both spatial and social, which implies the waning of locality ties and immediate interpersonal bonds.

(4) Increased social differentiation involving increasing specialization of persons and institutions, with increased division of labor and increasing interdependence (along with increased homogeneity implied by standardization in a mass culture based upon mass consumption).

(5) Decline of traditional social forms and the rise of secularized, rationalized social forms.

Table B-2

RESPONSES TO THE POLL QUESTION:



Source: Newsweek, December 10, 1973

There is, then, a plausible and rather direct linkage between alienation and the emergence of large urban environments. Some of the behavioral consequences attributed to alienation (Seeman, ibid) include a variety of ills common to our era:

- Political passivity
- Mental disorder
- School and work absenteeism
- School and work vandalism
- Wildcat strikes.

Scale and the Limits to Social Elasticity

At small levels of social organization, such as the village in more traditional societies, extended family bonds provide much of the "glue" that makes the social system cohesive. Identification, status, patterns of association grow from basic family ties and bonds. The development of larger social organizations, such as a city, must rely upon more than family bonds for social cohesion. In part this is true because our high rates of population mobility have broken down extended family structures. It also seems true because social organization does not proceed in a linear fashion--at some critical mass of aggregation, the cohesive possibilities of one form of social organization are exhausted. In modern society in general, and large urban environments in particular, we seem to rely increasingly upon "social elasticity" to provide the necessary "glue" to hold our society together:

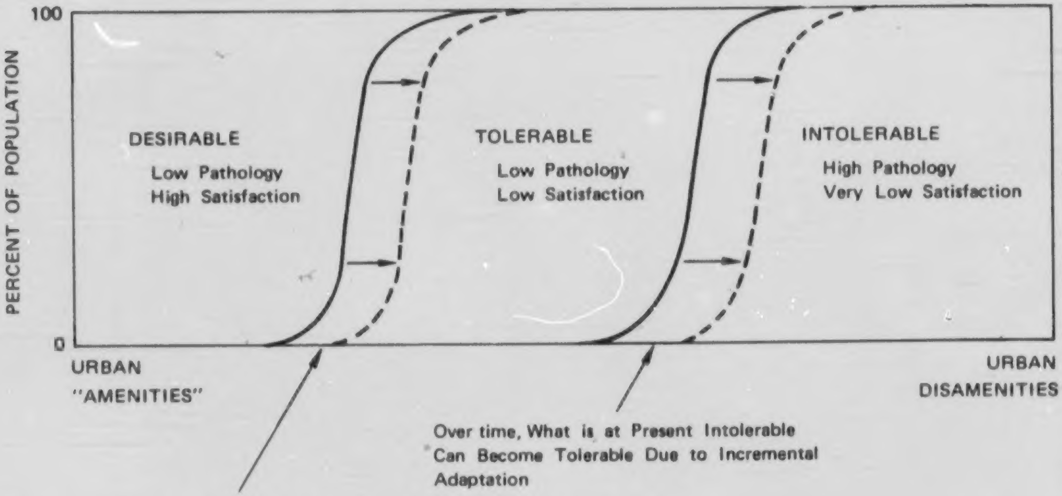
> This involves "criss-cross" bonds that permit the establishment of a veritable cobweb of associations of one sort or another, all of which transcend each other in such a way that each individual is linked to each other member of the society in at least one and preferably more ways.
>
> (Ecologist, 1972, p. 33)

These webs of association include our roles as: citizens, worker, husband or wife, student, sports fan, church goer, voter, hobbyist, etc. Ideally, all people will be included and linked together in the social structure through one form of association or another. Maintenance of social elasticity is a precondition to self-regulating social organization at larger scales. Yet, we may be approaching another critical mass of aggregation in our scales of urban places which are once again exhausting the cohesive power of this form of social organization.

> Without social elasticity there would be no bonds, no organization; in fact no real society. Yet social elasticity can only be maintained in special conditions. Thus it is likely that if the society grows too big, the bonds holding it together become of an ever more precarious nature and eventually incapable of holding it together. (*Ecologist*, 1972, p. 33)

Adaptation to the Urban Setting

In using intolerability measures of social-psychological well-being (e.g., excesses of violent crime, mental illness, suicide), we may implicitly assume that if these forms of pathological behavior are not substantially present, then our living environments must be desirable. However, this reasoning confuses what is *desirable* with what is *tolerable*. This confusion is demonstrated, for example, by a study (Gulick, et al., 1962), which found that people could lead a "reasonably contented existence" in a particular city. The nature of that contended existence is described in a summary sentence of the study: "In general, they have made a happy adjustment to the relatively superficial urban neighborhood social patterns and to the necessity of dealing impersonally with many people" (p. 356). This seems to say more about the adaptability of man and his capacity to tolerate any environment than it says about the desirability of that environment. Just because a condition is tolerable--and man's adaptive potential greatly increases his spectrum of tolerability--it does not mean that the living environment is therefore desirable. Further, the gap between what may be tolerable and what may be desirable is not necessarily constant. Over time the gap may widen, given the dynamic character of man's adaptability. This is graphically illustrated in Figure B-1 and finds an allegory in the laboratory demonstration in


100
0
PERCENT OF POPULATION
DESIRABLE
Low Pathology
High Satisfaction
TOLERABLE
Low Pathology
Low Satisfaction
INTOLERABLE
High Pathology
Very Low Satisfaction
URBAN
"AMENITIES"
URBAN
DISAMENITIES

Over time, What is at Present Intolerable Can Become Tolerable Due to Incremental Adaptation

Over time, What is at Present Only Tolerable Can Become Desirable if Incremental Adaptation• Includes Change in Belief Structures as Well

•A glimpse into the possible dynamics of adaptation can be inferred from the survey data, presented earlier, on public attitudes toward city size. Urban dwellers expected a net change for the worse in their community over the next few years, (as opposed to a substantial expectation for improvement by those living in small towns and rural areas). Large urban dwellers are seemingly facilitating their own adaptation by anticipating disamenities and then internalizing their potential impact over a period of time, thereby becoming accustomed (adapted) to them.

FIGURE B-1 HYPOTHESIZED RELATIONSHIPS BETWEEN DESIRABLE, TOLERABLE, AND INTOLERABLE ASPECTS OF URBAN EXISTENCE AND THEIR DYNAMICS OF CHANGE* which a frog was placed in a beaker of nearly boiling water and jumped out. However, when the frog was placed in a beaker of cold water that was slowly warmed to boiling temperature, the temperature change was sufficiently gradual that the frog adapted in increments, making no attempt to escape until he finally died. Analogously, the mere fact that a society can generate urban environments, and for a time adapt to them, does not necessarily ensure that it is a desirable thing to do. We can make errors and inadvertantly accept living environments which may prove lethal to both our social-psychological existence as beings seeking to unfold our potentials, and to our physical existence.

The nature of the adaptive process,that can allow us to tolerate even extremely undesirable conditions without exhibiting the warning signals of overt pathological behavior is discussed by Rene Dubos:

> ... Paradoxically, the dangers of over-population will be increased by the extreme adaptability of the human race. Human beings can become adapted to almost anything--polluted air, treeless avenues, starless skies, aggressive behavior, the rat race of over-competitive societies, even life in concentration camps .... (1967, p. 21)

> Man's physiological and psychological endowments thus give him a wide range of adaptive potentialities and enable him to survive and function even under extremely unfavorable conditions; however, the fact that all subsequent aspects of his life are affected by his past makes such adaptability a double-edged sword. (1968, p. 148)

Beyond simple physical adaptation, man's social adaptation takes the form of modifying belief structures to conform with the seemingly inescapable and unmodifiable reality of life experience:

> He changes the true physical world when he is able to: when he cannot satisfy his wants by engineering, he changes what he believes. (Berelson and Steiner, 1964, p. 664)

However, there are limits to this adaptive process. Unless we employ our technological abilities, which have been so successful in altering the external world, to alter ourselves, there do seem to be emerging limits to human adaptation:

> Every change causes a reorganization of personality during which anxiety is generated and persists while the individual's coping mechanism, and the supportive mechanisms provided by society, facilitate final readjustment. Here lies the basic issue of current times. Cultural changes, induced by the interaction of an evermore rapid pace of technological change with the increasing population, are now demanding an ever-increasing rate of change in personality structure ... we have entered an era of the lagging psyche and sustained anxiety. (Calhoun, 1966, p. 12)

Increased anxiety, alienation, disorder, and mistrust seem to be part of the price we must pay for the adaptation of our individual and collective social arrangements to an economic system which brings us such great material benefits.

> Society is limited in its capacity to adapt to environmental change, not only by its inability to comprehend it, but also, among other things, by the social disruption that must be caused by attempting to adapt too rapidly to such change. Science may facilitate comprehension, and may provide the technology for ensuring partial short-term adaptation to change, but by failing to provide the means for ensuring the corresponding adaptation of social structures, it must thereby determine their disintegration.
> (Goldsmith et al., 1972, p. 129)

And yet there is ample reason to think that we may extend ourselves beyond the limits of human adaptation. We tend to respond only to immediate crises that are sufficiently specific to allow ready identification; e.g., the energy crisis, the environmental crisis in its physical dimensions, etc. We are slow to search out or even recognize the existence of what may be much more significant social crises--leading to an intolerability condition whose dimensions are so amorphous and so intertwined with the whole social fabric that we can hardly stand back enough to establish even its skeletal form. These are essentially qualitative crises such as alienation, aesthetic deprivation, continuing mismatches between the character of the living environment and the altered need levels of people, overextension of social elasticity, etc. Unless a problem has a substantial physical manifestation which immediately threatens us, it is unlikely to get attention in an era plagued with crises. Yet the more subtle, qualitative problems, though they may manifest themselves only little by little in the short run, are of profound long-run importance to our society.

> But the technological conditions of production are not chosen with a view to enhancing man's experience of life. Nor has any social science the least say in their determination. They evolve solely in response to the requirements of industrial efficiency. Thus, the predominant influences bearing on man's welfare are generated accidentally; simply as a by-product of technological advance. It may well be suspected that the human frame and the human psyche are ill-adjusted to the style of living that technology is thrusting upon us, but willy-nilly technology marches on, leaving to the medical profession the unenviable task of dealing with an increasing number of casualties that are unable to cope with the strains and stresses of a rapidly changing world. (Mishan, 1970, p. 127)

Thus, adaptation--despite its limits--allows dangerous understatement of the significance of social disease by masking the warning signals of social pathology. Analogously, it is like a cancer that does not manifest itself with any substantial pain or discomfort until a week before the person reaches a terminal stage. To compound matters, where pathologies do emerge in our society, they often seem to be discounted as isolated phenomena which reveal little about the larger social condition. In the past, adaptation was perhaps the key to our success as a species. In the future it may be a source of our demise.

Conclusions

Summarizing briefly, the following conclusions emerge with respect to the social consequences of increasing urban scale.

- Large urban environments offer desirable social attributes for many people: economic diversity, cultural experience, anonymity, free expression of diverse life-styles, opportunities for personal achievement. For others, these same environments have undesirable attributes along similar dimensions: an underlying homogeneity yielding superficial diversity, cultural breakdown, alienation, too much competition. Clearly, no easy generalizations are possible.
- Our urban places are primarily economic entities whose function and structure can be largely explained through economic efficiency variables. The "law of the inoptimum" states that no species encounters in any given habitat the optimum conditions for all of its functions. Therefore, to see our urban habitat maximizing economic functions to such a degree, there is implicit confirmation that the social aspects of existence are not being simultaneously maximized, and possibly cannot be. Our larger urban places are where the economic articulation of function and structure is greatest.
- The issue of density is only of peripheral importance to this study since it is only modestly correlated with scale. In any event, the findings which relate crowding to social pathology are generally inconclusive although there does seem to be a slight increase in some pathologies as density increases. The ambiguity of the findings may be largely attributable to the crudeness of the measuring processes.
- There is relatively little information correlating social pathology with changing city size. Perhaps the most extensive data, which relate the rate of violent crime to city size, reveal a striking correlation between increasing scale and increasing rates of violent crime.
- The perceptual and aesthetic attributes of our living environments are of tremendous importance in creating our sense of self and, consequently, in shaping our patterns of behavior. The aesthetics of our urban places--premised upon simplicity, economy, and efficiency--have diminished perceptual diversity. This built-in perceptual poverty cannot help but simultaneously impoverish their inhabitants.

Another source of loss of diversity has been in the diminution of rural to urban migration. The loss of rural migrants, with their significantly different perceptual patterns, constitutes a significant loss in "imported" perceptual diversity. Further, urban scale makes access to the natural environment inherently more difficult since much greater distances must be traveled to escape the urban region.

- Alienation is difficult to define empirically but includes a sense of powerlessness, normlessness, meaninglessness, and social isolation. All contemporary trends associated with the emergence of alienation are directly or indirectly tied to the growth of very large urban environments, e.g., the enlargement of living scale beyond human comprehension, the decline of kinship ties, increased geographic mobility, increased social differentiation, decline of more traditional social forms and the rise of secularized, rationalized social forms. Alienation is given a causal role for a variety of contemporary social ills including: political passivity, mental disorder, school and work absenteeism, school and work vandalism.
- Social elasticity is a term for the cobweb of personal associations which relate diverse people to one another. This is a critically important cohesive force in our society which has transcended scales of social organization based on family ties. With the emergence of even larger scales of social organization--the megalopolis--even this form of social organization may not maintain social cohesion. Larger scales, then, may be a socially disruptive factor that demands unknown forms of social cohesion, perhaps highly formalized and rationalized external controls--as a replacement for social elasticity.
- Man is highly adaptable. Our adaptability allows us to tolerate--and thereby mask warning signals of social pathology--even undesirable living environments. In our construction of social policy, we often seem to confuse the tolerability of an environment with its desirability.

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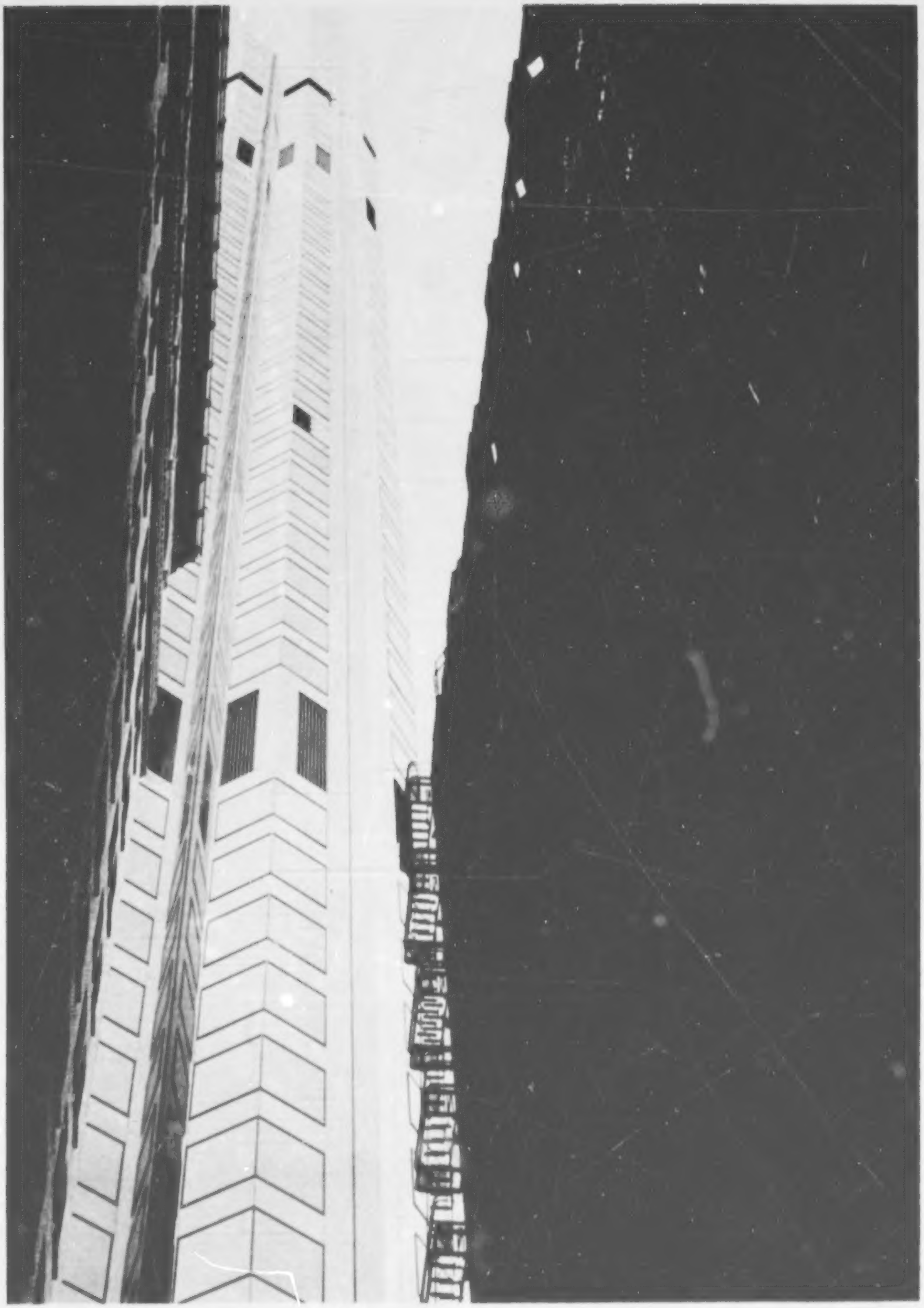


BEHAVIORAL PROPERTIES OF LARGE, COMPLEX SYSTEMS

by

Duane Elgin

It is appropriate to characterize our urban places as systems. Systems theory, in turn, informs us that large, complex systems have different behavioral properties than smaller, simpler systems. We explore below the quantitative and qualitative differences between larger and smaller systems, and whether these differences imply that we should limit the size of our larger urban systems. Although this is an admittedly inferential mode of analysis, it is a powerful way of addressing the question of whether some of our urban systems have grown too large. The issue is not whether a large system is inherently "good" or "bad"--it is rather whether a city system, whatever its size, has survival value and whether it is supportive of human growth and development.

Systemic Properties that Favor Urban Agglomeration

Before examining the limiting properties of larger urban systems, it is useful to describe those forces which impel urban systems toward further agglomeration:

- Economies of large scale production--When a critical level of production is reached, it becomes much easier to employ mass production techniques which can greatly increase productivity. Larger systems allow greater degrees of specialization in work roles and, in a mass production economy, complex work operations can be divided into a series of simpler ones--each of which can be performed at high speed when the worker is aided by specially designed equipment. To a point, production of a complex product can be broken down into a number of sub-tasks which demand a lower skill level and the repetitive character of the task allows more rapid development of manual proficiency.

- Mobilization of resources--Large agglomerations of people and economic activity provide a more substantial base from which resources can be mobilized for specific objectives, e.g., going to the moon, fighting a war, building a steel plant.
- Material abundance--Our large urban-industrial systems have been both the primary instruments and products in our attainment of unprecedented levels of material wealth for a massive population.
- Diversity of goods and services--The characteristic specialization of larger systems extends the range of goods and services that can be produced.
- Efficient use of transportation and communication--Concentration of population into larger urban systems increases proximity of economic activities and, up to a point, reduces the cost (in time and distance) of connecting economic activities.

The Failure of Success

There is increasing reason to suggest that we have been "too successful" in the development of our large urban systems and these successes carry unintended and oftentimes unexpected problems with them which are as severe as the problems that the systems growth was expected to eradicate:

- One of the very few "laws" in economics is the law of diminishing returns. When this essentially economic concept is applied to urban areas it should include social, political, environmental, and spiritual factors as well. It seems plausible that either in the more restrictive economic definition of this law or particularly, in the more expansive definition, our urban systems may have already grown beyond the point where they yield increasing returns to scale and now begin to intrude upon the region of diminishing returns to scale. If we had the macro-socioeconomic tools to measure the phenomenon, we might well find that an increasing proportion of our resources are used simply to sustain our urban systems and to ameliorate the problems engendered by too much success rather than to yield any substantial net increase in human well-being.
- We can mobilize and use massive amounts of resources through the mechanism of our urban systems--only now we find that we are

reaching limits to consumption of energy and other material resources. What was a successful urban system, when premised upon unlimited resources, can become a counterproductive system when premised upon scarce resources.

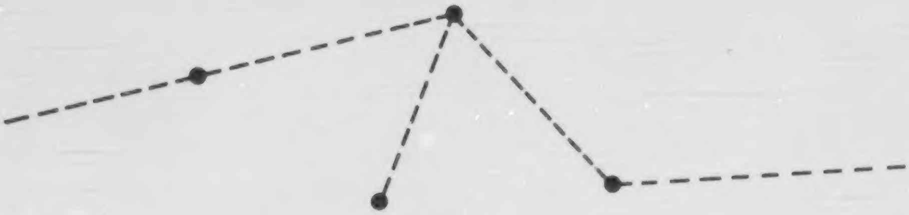
- Highly specialized work roles can enhance productivity, but that degree of specialization can at some point become dehumanizing. The results--worker alienation, absenteeism, vandalism, boredom--may lower productivity, and product quality. Again, there is the sense that what had been a successful concomitant of urban growth--specialization and division of labor--may have gone too far and is now counterproductive.

- A diversity of consumer products and services is also an attribute of large urban environments--yet there seem to be more and more people who yearn for a simpler life, one less cluttered with the cultural artifacts--the electric toothbrushes, electric can-openers and knives, the countless products with meaningless differentiation among brands to choose from--of a high technology, urban-industrial economy. Again, perhaps what was a useful and worthwhile trend has exceeded its own utility and it is now counterproductive.

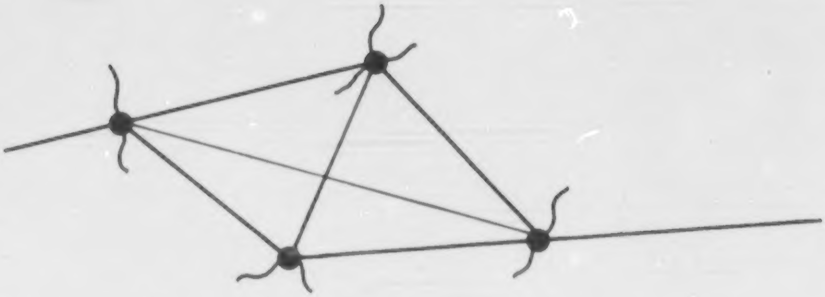
- Our urban places are becoming so large and congested that they no longer are the efficient users of transportation and creators of face-to-face communication. An often noted fact is that commuting time across Manhattan was faster with the horse a hundred years ago than it is with a car today. And, as noted in a later section (Economics of City Size), our larger cities are places where commuting time is greatest, and less and less they are places where top executives gather for face-to-face communication.

Self-Limiting Properties of Large Systems

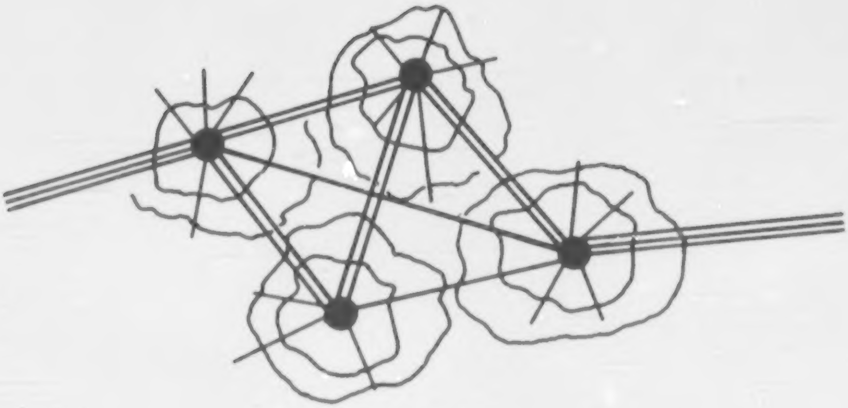
Figure C-1 illustrates the growth from smaller to larger urban systems. While this is an abstract representation of the growth of transport networks as a city grows into an urban region, it could illustrate equally well the growth of communication networks or channels of economic exchange. This figure also illustrates the applicability of "Engel's Law" to the growth of our urban systems. Engel's Law (Ellul, 1964) states that as some critical mass or threshold level of quantity is reached



STAGE I



STAGE II



STAGE III

FIGURE C-1 ABSTRACT ILLUSTRATION OF GROWTH OF AN URBAN TRANSPORTATION SYSTEM WHICH, AT A CRITICAL MASS YIELDS A QUALITATIVELY DIFFERENT SYSTEM (again, the "quantity" may be transport networks, people, communication networks, economic activities), there may emerge a qualitatively different system from what went before. It is qualitatively different because in some perhaps intangible but significant way, the system is greater than the sum of the parts. Have our larger urban systems passed this critical threshold level of aggregation? If so, what are the qualitative manifestations of this possibility? These issues are addressed below in the context of specific self-limiting properties of large systems.

Interdependence and Vulnerability

As we have become a highly developed industrial nation, there has simultaneously emerged interlocking communication, transportation, and economic networks. Our intensely interrelated systems, in turn, are increasingly vulnerable: a localized power grid failure can plunge the whole U.S. Eastern Seaboard into darkness; the shutdown of a single brake plant can eventually stop production at major auto assembly plants and cause cutbacks in orders for glass, rubber, steel, etc. Although there is a degree of redundancy and consequent resiliency in our urban systems, there remains the characteristic of increasing vulnerability as interdependence grows. As Michael (1968) has pointed out, this weakness is further aggravated by the clear possibility that as the size of the population increases, "even if the percent of disturbing events that occur doesn't increase, the number of events that occur will increase." (p. 19.) Further, it seems plausible that even the percent of disturbing events may increase since, as more people and processes are grouped together, the number of linkages (vulnerability points) increases more than proportionately.

Complexity and Incomprehensibility

As our urban systems increase in size, they also tend to become much more complex--the number of individuals, relationships, institutions, occupations, interconnections, and activities becomes incomprehensibly vast. Given biological, mechanical, time, and learning limitations to the human capacity to assimilate and use information, it seems plausible that associated with growth of our urban structures would be an increasing inability to maintain a constant relative level of comprehension. Miller (1967) states:

> The human mind has a limited capacity for acquiring and storing information... there is some limit to the overall capacity of a man's memory, a limit to the magnitude and complexity of any cognitive system that a man can internalize... We can stretch our limited span of attention by carefully organizing information hierarchically and then dealing with our problems at a rather abstract level... But if memory is also limited, this hierarchical strategy must have its limits... And even if memory were an unlimited vessel, the rate at which experience could fill it would impose limits on the amount it could contain... we are faced with an upper bound on the information we can expect an individual to have at his personal disposal. (p. 886).

It seems appropriate to inquire whether our larger urban environments are reaching the limits of tolerable levels of complexity.

The trend toward increasing complexity in our urban systems can have other impacts upon people who inhabit those systems. The following are illustrative:

- Economically--Increasing complexity implies increasing specialization and differentiation of economic functions. While this increases the variety of goods and services and the variety of work roles, it also increases the danger of job obsolescence through technological displacement, and it increases the sensitivity of many jobs to economic dislocations in the larger economy.

- Politically--Complexity diminishes the capacity of citizens, politicians, and civil servants to maintain knowledge parity with the problems and policy alternatives they confront.
- Environmentally--In place of an ecological system that is self-stabilizing through natural processes, we now have a complex, man-made, ecological system. It is very difficult to discern the direct consequences that accrue from haphazardly introduced pollutants, let alone sort out the interactive system of esoteric contaminants that now pervade our living environments.
- Socially--The complexity of our social system makes effective socialization and enculturation all the more difficult. The term "future shock" seems to resonate with many people as they attempt to live in a present of bewildering complexity, with few significant social guidelines on direction.
- Psychologically--Complexity increases the level of incomprehensibility of the system, and people may retreat from that complexity through psychological insulation. A person's sense of wholeness and congruence is diminished as he becomes unable to effectively comprehend his surrounding social system.

Interdependence and Control

Increasing interdependence and associated vulnerability requires that the whole system be guided. To allow any significant element to exist outside of the domain of guidance is potentially to threaten the entire, intertwined network. Interdependence, then implies pervasive regulation and control. The coherent regulation of an entire system may imply the need for centralization in the hands, for example, of a strong mayor. This, in turn, raises the question as to the capacity of the mayor and his staff to maintain their own relative political maturity in the face of such a complex array of issues. Or the system may be regulated through decentralized decision-making structures. Then, there is the increasing possibility that the goals and objectives of the subsystems may not be in harmony with the goals of other subsystems or of the larger system.

Vickers (1970) makes a crucial distinction between the power to create a system and the power to control it. We have assumed "... that men would have the greatest control in the area over which they could exercise the greatest power" (p. 40). Vickers further suggests that, in some respects, "the more man-made the environment, the greater its instability" (ibid.). If systemic impediments to the effective exercise of control make our man-made systems inherently unstable, then it may be dangerous to assume that the power to create a large urban system automatically confers a concomitant power to control it. The limits of control in complex systems is a theme also explored by Eisley (1974):

> We organize in one way, but as the complexities of civilization mount, what the physicist would call background noise mounts. The degrees of disorder begin to compete with the order man tries to establish. The question is, Is the mind of man capable of carrying up order to the point where he can control this background noise that modern urban society produces, or is there a limit to what the human mind can encompass? (p. 22).

A similar theme is suggested by Max Ways, writing in the February 1970 issue of Fortune magazine: "... in modern society the principle of fragmentation, outrunning the principle of unity, is producing a higher and higher degree of disorder and disutility."

The mammoth multinational corporations may offer a working example in "organic control" processes which we can effectively translate to the urban context. However, the subsystems in a large corporation have relatively limited and measurable goals (e.g., profit, sales, market share) which are readily comparable with those of other subsystems. In an urban system, the subsystems have such divergent and intangible goals (e.g., educational "achievement," providing "welfare" and public "services") that it is extremely difficult to find mutuality of purpose among subsystems and thereby ensure their effective coordination and resolution at the macro-system level. Perhaps, just as our economic mechanisms are efficient in the production of private goods and inefficient in the production of public goods, the means of control in the private sphere are not readily translatable to the public domain.

Systemic Rigidities and Diversity of Form

Another important property of urban systems is described in the general proposition that: growth creates form but form limits growth. Alternatively, the growth of a city might be likened to swimming through progressively hardening concrete. As urban sectors develop, both physically and institutionally, and become increasingly interdependent, it becomes more and more difficult to make any significant changes in the system without increasing amounts of disruption and cost.

The foregoing seems a particularly important insight if the system is undergoing significant functional changes--as are many of our larger urban places. If urban form is largely structured by economic forces and functions, then as those functions change or evolve (e.g., movement from one industrial base to another, or movement from a predominantly industrial base to a predominantly service base), existing forms may inhibit smooth alteration. The high capital costs associated with the existing homes, roads, and factories may not allow a smooth or rapid transition to new functional orientations--old forms limit growth to new forms.

A related issue is that of diversity of form. We traditionally assume that our larger urban systems contain a wider variety of goods, services, people, and activities and therefore present more diversity than do smaller urban places. Certainly this is true in the case of economic diversity--large scales permit specialization and division of labor which yield substantial heterogeneity of economic activity. But there also seems to be an underlying structural homogeneity in our urban places created by the "standardizing" influences of market place and physical forms designed to maximize economic efficiency and return. Thus, diversity premised upon essentially economic criteria could certainly exclude other, more qualitative aspects of diversity which are essential if people are to realize their full potentials.

With respect to the differences in form between a large and small urban place, Slater (1970) states that: "a small town is a microcosm, a suburb merely a layer" (p. 9.) This suggests that diversity at the macro-scale is no assurance that there will be the diversity at the micro-scale which is the experiential reality of people's daily lives.

Tendency Toward Low Performance

Jay Forrester, in his book Urban Dynamics (1969),states that "complex social systems tend toward a condition of poor performance." (p. 112.) Poor performance, in turn, seems to be a consequence of "counter-expected" behavior of those systems which contain a substantial political component--a prime example being an urban system. Political pressures, in the American instance, often favor short-term policy measures. Short-term expediency, in turn, sets the stage for long-term degeneration of the system. The counter-expected element enters when short-term actions, which may have produced good results, are redoubled in times of crises and the "intensified action produces another short-term improvement and still deeper long-term difficulty." (p. 112.) Although Forrester does not specify performance indicators to verify the counter-expected and degenerative behavior of large and complex systems, there does seem to be an intuitive logic to the argument--particularly in times of transformational, systemic change.

In times of transformational change, the basic operating premises of a society come into question. Some potentially obsolete premises of our present era are described in Table 1. To investigate what happens to a system whose operating premises or "generating rules" are called into question, we must go back a few steps. A system implies mutual causal relations. Under such conditions, "complex patterns can be generated by simple rules of interaction and it oftentimes takes more information to describe the finished patterns than to describe the generating rules..." (Maruyama, 1973, p. 436). If this is so, then our complex urban systems could have been plausibly created by some relatively simple generating rules. These generating rules have been primarily free market forces and the drive for functional economic efficiency. As suggested in Table 1, these generating rules or operating premises now seem to be suffering from the failures of their successes--they have succeeded so well that we now need to develop new generating rules to go beyond the conditions they have helped to create. If these relatively simple generating rules, which largely created the complex urban system, are called into question, then the overall system in its complex articulation also comes into question. Under such conditions, we might well expect low performance of the system to result as the whole underlying rationale for the system is challenged.

Conclusions

Large urban systems have different behavioral properties than smaller systems. Reiterating briefly, the potential deficiencies of larger systems are:

- Growth to the point of diminishing returns when considered from an overall socioeconomic perspective; however, since we do not have the indicators to measure this expectable outcome of systems growth, we behave as if it would not occur.
- Successful systems, when premised upon plentiful resources, can become unsuccessful when premised upon scarce resources.

Table C-1

POSSIBLY OBSOLESCENT PREMISES THAT TYPIFY THE INDUSTRIAL ERA

1. That individual identity is to be equated with material possessions acquired and/or occupational status achieved.
2. That mankind is separate from nature, and hence it is our destiny to master nature.
3. That people are essentially separate, so that little intrinsic responsibility is felt for the effect of present actions on remote individuals or future generations.
4. That progress is synonymous with growth of GNP, that quality of life is furthered by a system of economics based on ever-increasing consumption.
5. That there is freedom in affluence, that it is possible for people to earn "enough" money, and simultaneously have full freedom of choice.
6. That both societal growth and protection of one's own interests are best served by competitive aggressive behaviors.
7. That the individual should be free to make his own choice of "the good," and that the choices he makes in pursuit of self-interest will somehow add up to desirable overall societal choices.
8. The "technological imperative" that any technology that can be developed, and any knowledge that can be applied, should be.
9. That economic efficiency should be pursued indefinitely through the organization and division of labor and the replacement of humans by machines.
10. That the search for knowledge is appropriately dominated by utilitarian values--science supported to the extent that it promises new manipulative technologies.
11. That man is rational and that reductionism in positivistic scientific thinking is the approach to knowledge most to be trusted.
12. That the aggregate knowledge of specialized experts constitutes wisdom.
13. That the future of the planet can safely be left to autonomous nation-states, operating essentially independently.
14. The "political premise" that "what ought to be" is not a meaningful concept because it is not achievable.

- The highly specialized work roles implied by the division of labor found in large urban systems may contribute to worker boredom, absenteeism, lowered productivity, and lowered product quality.
- As system size increases, interdependence increases and vulnerability of the system to damaging peturbations increases.
- Larger systems are more complex, and that complexity makes the system less comprehensible and less amenable to effective regulation/control.
- Growth of a system creates form but that form, in turn, inhibits the nature of future growth, thereby locking us into a relatively inflexible physical form.
- Larger systems tend toward conditions of low performance.

These systemic differences, when considered collectively, may diminish the "survival" value of large systems in times of stress; diminish the effective performance of the system generally; and make the system less responsive to the growth needs of individuals.

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THE POLITICS OF LARGE, COMPLEX SYSTEMS--THE LIMITS TO URBAN DEMOCRACY

by

Duane Elgin

In an earlier section, we discussed several properties of large systems. Three of these properties (complexity, interdependence, and scale) have particular significance for the functioning of democratic processes in large urban environments. They are discussed below.

Complexity and Individual Capacity

Increasing scale implies increasing complexity which, in turn, has profound implications for the nature and efficacy of our political processes. Shubik (1967) notes that:

> Man lives in an environment about which his information is highly incomplete...As the speed of transmission of stimuli and the volume of new stimuli increase, the limitations of the individual become more marked relative to society as a whole. *Per se* there is no indication that individual genius or perceptions have changed in an important manner for better or worse in the last few centuries, but the numbers of humans, the size of the body of knowledge, and the complexity of society have grown larger by orders of magnitude....As the number of individuals, things, and concepts grows, it becomes more and more difficult to maintain a constant relative level of information...Yet even with our ingenuity for coding, the overload grows, especially if we wish to maintain values that stress individual men not as small component parts of the social intelligence, but as individuals. (pp. 772-773)

Donald Michael, in his book *The Unprepared Society* (1968), also explores the limits at which knowledge can be acquired and used in our complex society:

> But this increased number of sources reporting on and interpreting the state of man and the universe will not necessarily mean that the interested citizen or professional will have an enlarged and more balanced view of what is "really" happening. First, he will have to know where to look, through what sample of information sources, to get an adequate range of interpretations. This will become more difficult to do as the number of information sources increases. But even if he does discover a valid sample of positions, he will then have the difficult task of integrating them to arrive at an informed position based on them. Given the complexity of the issues, and the rapid rate of change in them, and given the assertions of each source that it has the full and balanced picture that its "exclusives" are the true and full ones, the tasks, of differentiation, discrimination, and integration will become steadily more intricate for those who seek to know and to act on what they know...The problem of evaluating the adequacy and validity of technical knowledge...in order that individual citizens and contending organizations can act informedly in their own interests will become more difficult. (pp. 21, 30)

Not only do there appear to be biological and mechanical limits to the acquisition of knowledge, there are motivational limits as well. Downs (1957) explores the rationality of ignorance in a large democracy:

> Therefore, we reach the startling conclusion that it is irrational for most citizens to acquire political information for purposes of voting. As long as each person considers the behavior of others as a given, it is simply not worthwhile for him to acquire information so as to vote "correctly" himself. The probability that his vote will determine which party governs is so low that even a trivial cost of procuring information outweighs its return. Hence ignorance of politics is not a result of unpatriotic apathy; rather it is a highly rational response to the facts of political life in a large democracy. (p. 147)

The real world implications of this apparent inability and unwillingness to participate actively in large scale democratic processes is distressingly reflected in the inferences that were drawn from a recent Louis Harris poll commissioned by Congress:

> ...the current level of public knowledge about government and political affairs is fragmentary at best, and most Americans seem to have only the slightest personal involvement with the real workings of politics and government...the American public seems aware of its intelligence gap. Asked about being "up-to-date" on developments in the Federal government, 60 percent confessed that they were not...64 percent said they could name at least one U.S. senator from their state--but only 59 percent were correct, and only 53 percent got their senator's party affiliation. As for their second senator, no more than 42 percent of the public even claimed to know his name and only 39 percent really did...the degree of public involvement in the nitty-gritty of the democratic process is distressingly low. (Newsweek, December 10, 1973)

Perhaps equally disturbing is the fact that our elected political representatives are also confronted with overwhelming complexity and information overload. In Congressional hearings, Huddle (1969) captured the problem of complexity and information that confronts members of Congress:

> How does a popularly elected Congressman find the time and the experience to resolve complicated problems in an unfamiliar field? For example, when Congress undertook the technology assessment of proprietary drugs, the issue that climaxed with the near-disaster over thalidomide, there were several sets of committee hearings that went on for 8 years, and filled almost 18,000 pages of testimony. Congress is finding the burdens of deciding technical issues almost intolerable. The progress of events is moving too rapidly. The consequences of congressional decisions are more fateful, yet the decisionmaking is more urgent. Clearly, ways must be found to improve the process. (p. 371)

Koestler (1941) anticipated the impact of complexity upon political processes with his useful notion of "relative political maturity":

> Now, every technical improvement creates a new complication to the economic apparatus, causes the appearance of new factors and combinations, which the masses cannot penetrate for a time. Every jump of technical progress leaves the relative intellectual development of the masses a step behind, and thus causes a fall in the political-maturity thermometer. It takes

> sometimes tens of years, sometimes generations, for a people's level of understanding graudally to adapt itself to the changed state of affairs, until it has recovered the same capacity for self-government as it had already possessed at a lower stage of civilization. Hence the political maturity of the masses cannot be measured by an absolute figure, but only relatively, i.e., in proportion to the stage of civilization at the moment. (p.168)

This is essentially the idea that people (whether politicians or public) must acquire knowledge at a rate at least equal to the pace at which decisions become complex in order to maintain just a constant capacity to deal with problems. Graphically, this might be characterized as:

$$\text{Relative Political Maturity} = \text{function of} \left(\frac{\text{Knowledge}\uparrow}{\text{Complexity}\uparrow\uparrow} \right) \downarrow$$

The geometric or even exponential increases in the complexity of our urban systems may be creating a condition where advances in our capacity to generate and use knowledge are more than offset by complexity--the net result being a decline in our relative political maturity despite an increase in our absolute level of political maturity. One consequence of this for the layman may be that the layman is placing increasing reliance upon the expert or specialist who presumably has sufficient knowledge to deal with emerging orders of complexity. Mishan (1970) reveals an important pitfall in this approach:

> The innocent layman surrounded by a growing array of specialists of all kinds--in the social sciences by economists, sociologists, anthropologists, psychologists, and others--is deluded into believing that his welfare is in good hands whereas, in fact, there is no social science expressly concerned with human welfare in the round. (p. 126)

Scitovsky (1969) notes how the specialists in turn may function in such a way as to undermine traditional political processes:

> Increased specialization of knowledge tends to turn professional people from intellectuals into technicians. This means that as each of them gets to know more and more about

> less and less, he becomes not only more of an authority in his own field but also more willing to accept the authority of others on matters outside his own field. In other words, specialization renders the professional classes not only a better tool of authority but also a more pliable one, and makes them abdicate to an increasing extent their traditional role of upholders of political liberties. (p.42)

Under conditions of complexity that severely compromise relative political maturity, the public may become increasingly reluctant to confer power on the experts and specialists. Yet because the laymen are without the capacity to make well informed decisions themselves, the systems may edge toward a condition of being truly "out of control." On the other hand, increasing decision-making power may be given to the "experts" who--not having an understanding of human welfare in the round and having more and more knowledge about less and less--become more pliable in matters outside of their realm of expertise, and are also incapable of ensuring the overall well-functioning and integrity of the larger systems. The elected government official or civil servant in turn may also attempt to provide the understanding and synthesis to ensure the proper functioning of our urban systems. And yet, our urban governments are subject to the same pressures toward specialization that affect other institutions and individuals.

These conditions are compounded by the archaic governmental forms which characterize many of our large metropolitan regions. According to Holleb (1969) (p. 31):

> Metropolitan areas are virtually ungoverned; responsibility is fragmented among a multiplicity of governmental units and agencies, each guarding their almost feudal, territorial fiefdoms. Our abilities to build coordinated urban programs and to focus resources upon the areas of greatest need has been severely limited by these anarchic and anachronistic structures.

These factors have important implications for both the politician and the public. For the politician, they may mean: an unbearable workload as he attempts to maintain his own relative political maturity; gross disparities between the public's appreciation of a problem and his own perception of it; unrealistic expectations by the public as to the ability of the political processes to cope with a problem; increasing reliance placed upon "expert" opinion but uncertainty as how to aggregate that opinion into policies concerned with the welfare of the whole urban system; increasing reliance placed upon incremental decisionmaking which, in times of systems stress (which seem more the rule than the exception) are innapropriate. For the public, these conditions may mean an increasing deferral to and reliance upon their elected representatives and a decline of direct participation or interest in the political processes. When, as seems inevitable given the circumstances, the politician and/or civil servant fails, the public may withdraw its legitimacy, trust, and support but be unable to offer constructive alternatives to the situation.

Although this is a bleak and rather one-sided scenario of the politics of complexity in our large urban environments, there do seem to be substantial dangers enough in large complex systems to impair the integrity of our democratic processes and/or fail to effectively govern the systems.

Interdependence and Control

Another property of systems that has important political implications is the notion of increasing interdependence as the size of the urban system increases. Sevareid (1970) describes our present situation:

> We now live in and by the web of an enormously complicated, intensely interrelated technology, the whole no greater than its parts and its strongest parts at the mercy of its weakest links. This is a way of life that depends absolutely on order and continuity and predictability. But it happens that we have simultaneously reached a point of discontinuity in the political and social relations of men, where little is predictable and disorder spreads. (p.1)

In earlier times, when our society was comprised of many small and virtually self-sufficient units, a wrong decision, natural disaster, or intentional disruption had very limited consequences. Today, each of these forces can have potentially vast consequences for large parts of our social systems. We see this, for example, when a rail or bus strike called by a margin of a few votes forces millions to walk, endure mammoth traffic jams, or simply stay home from work. Interdependence and consequent vulnerability requires that to some extent, the whole system be guided--to allow any element to exist outside of the domain of guidance is potentially to threaten the entire interlinked network.

At this juncture we can note a profound conflict between the demands of control and specialization. Systemic interdependence implies the need for a broad focus of control. Systemic complexity implies a need for a narrow focus of expertise or specialization in order to reach adequate levels of sub-system understanding. In the larger urban systems, then, the focus for control and regulation is increasingly broad while the focus for understanding is increasingly narrow. Who then can be sufficiently expert to exercise pervasive control responsibly? Can the city mayor perform this task, even with the help of his staff? From a centralized perspective, can the city mayor perform this task without being overwhelmed by vast amounts of information requiring expert analysis? From a decentralized perspective, can city agencies as subsystems exercise function independently without compromising the need for overall coordination of activities of the larger system? Hanlon (1970) states the dilemma well:

> Throughout the world, as we advanced into the technological era and our society became more and more complex, we developed more and more and narrower and narrower specialties. Everybody learned more and more about less and less. Each of us 'did his own thing,' and we let other specialists 'do their own thing.' It was assumed, I suppose, that if each of the parts of this complex system we were creating worked to perfection, the whole contraption could not fail to operate. (p. 2).

Reiterating the conflict that emerges in larger systems:

- Interdependence implies the need for a broad focus of control/regulation.
- Complexity of large systems makes specialization, which implies narrowing of focus, a necessity for adequate understanding. For those who cannot specialize, e.g., the mayor or equivalent, complexity reduces the comprehensibility of the system being governed and increases the likelihood of attempting to employ simple solutions to solve complex problems which, in turn, increases the likelihood that the system will tend toward low performance levels.

Scale and Involvement

There are two dominant ways in which large scale can diminish political involvement. It can reduce the access of the citizen to his representatives and it can diminish the perceived significance of his involvement in the decision-making process.

Even if population increases in an urban area are compensated for by increased staffing and efficency in intermediate levels of governing, the larger the number of citizens becomes, the more indirect and complex must be the channel of communication between citizens and leaders--and the amount of time that can be devoted to any one citizen by an elected official is reduced. The same constraints that have demanded a shift from direct democracy to representative democracy have increasingly demanded a shift to an "insulated democracy." There is only one mayor, one governor, one president and as the number of people grows under his jurisdiction, a seemingly inevitable consequence is a reduction in the amount of time that can be spent with any person or constituency until, at some point, access to the official may be virtually eliminated altogether. Dahl (1967), in his discussion of the appropriate scale for a well-functioning political system states:

> ...the larger a system grows, the more and more one-sided becomes communication between citizens and top leaders: the President of the United States can, in principle, speak directly to a hundred million potential voters, of whom only an infinitesimally small fraction can ever speak directly to him...The essential point is that nothing can overcome the dismal fact that as the number of citizens increases the proportion who can participate *directly* in discussions with their top leaders must necessarily grow smaller and smaller. (p. 957)

The impact of scale in creating enormous and difficult time pressures is reflected, for example, in the changing operation of the U.S. Supreme Court. Every year the Court receives several thousand appeals and dismisses some 90 percent of them after very brief consideration and without (save in the rarest of cases) hearing oral arguments for more than an hour per side. This contrasts sharply with the days when Justice John Marshall had time enough to hear Daniel Webster orate for several days upon the "small college he loved" in *Dartmouth College v. Woodward* (1819). And the problem repeats itself in other forms at other levels of government--including urban government. Secondly, as scale increases, political participation for most people is reduced to the single act of voting in elections. Conversely, the smaller the political unit, the greater is the opportunity for citizens to participate in decisions of their government--and yet those decisions will likely be "trivial" if that smaller political unit is part of a larger interdependent entity. Again, Dahl in his article, "The City in the Future of Democracy," states:

> Thus for most citizens, participation in very large units becomes minimal and in very small units it becomes trivial. At the extremes, citizens may participate in a vast range of complex and crucial decisions by the single act of casting a ballot; or else they have almost unlimited opportunities to participate in decisions over matters of no importance. At the one extreme, then, the people vote but they do not rule; at the other, they rule--but they have nothing to rule over. (p. 960)

Verba (1969) reaches a similar conclusion in his analysis of democratic participation in large scale systems:

> Insofar as one is dealing with a large-scale social system, the likelihood that any individual or group will have an effect on policy is slim. If large numbers have an effect on the outcome--as in elections--the contribution of any single individual is likely to be very limited. Under such circumstances, the payoff for any individual to participate is small. He can accomplish little by himself, and the effects of his participation on the outcome are not noticeable... Scale, therefore, puts severe limits on the amount of successful participation. But if the scale of the decisional unit is smaller, there is much greater opportunity for participation that is high in informational content and high in its likelihood of success. (p. 153)

Compounding the present dilemma for the citizen is the emergence of a curious paradox noted by MacMichael (1974). When the political unit was small and the body of knowledge comprehensible to the individual, politics was traditionally non-participative and authoritarian, its forms did not permit the non-elite individual role. Now, when the political unit is enlarged beyond human scale and the body of knowledge is inflating and undergoing change at a confusing rate, politics becomes--normatively and nominally--a non-authoritarian and participative process in which each individual is declared responsible and exhorted to play an effective part. Metaphorically, the peasant who was forbidden to trap rabbits is now, as citizen, directed to hunt tiger--without measurable increase in his power. Perhaps the reality of the situation is that as we defer in our political processes to an intellectual/power elite, we compensate by trying all the harder to maintain the illusion of participatory democracy.

Conclusions

This brief exploration of attributes of large urban systems that are relevant to the functioning of democratic processes can be summarized as follows:

- Large systems are generally complex and that complexity, in turn, limits the rate of effective acquisition and use of knowledge, which makes the maintenance of "relative political maturity" more difficult--for all constituents in the political process.

- As effective political participation of the average citizen is diminished by lack of relative political maturity, and as the effective comprehension of highly complex issues becomes more difficult for the politician and civil servant, increasing reliance is placed upon specialist/experts--persons who are essential to the system but outside of the usual checks and balances of American political processes.

- Large systems are generally interdependent which, in turn, implies the need for a broad focus of regulation and control. Interdependent systems are generally more vulnerable, and this reinforces the need for effective regulation and control.

- Complexity of large systems makes specialization--which implies a narrowing focus of information acquisition and use--a necessity for maintaining adequate levels of understanding. For those who cannot specialize, given their mandated broad focus of concern (e.g., the mayor), complexity: (1) reduces the comprehensibility of the system being governed and increases the likelihood of attempting to employ simple solutions to solve difficult problems which, in turn, increases the likelihood that the system will tend towards conditions of relatively low performance; and (2) increases the reliance upon specialists and experts, thereby diminishing the involvement of relatively "ignorant" citizenry.

- Large systems, which are increasingly interdependent, are also increasingly rigid since no part can be changed without affecting the other components of the system. Larger systems are therefore more inflexible and resistant to change.

- As scale increases, the number of constitutents generally increases at a much faster rate than the number of governing officials; the result is that the amount of time an official can spend with any one person or group is proportionately diminished.

- As scale increases, the impact of any one individual upon the outcome of an election is diminished since the individual is but but one among millions. The payoff to participating knowledgeably under such circumstances is small. Participation in very large systems becomes "trivial" through the media of voting; participation in the subsystems of a large system (where the individual could presumably "make a difference" since he is not overwhelmed numerically) also becomes "trivial" since the issues are generally not of substantial significance. Large systems, then, trivialize political involvement.

- These inherent difficulties, are compounded by the historical impediments of anachronistic, archaic, and fragmented forms of metropolitan governance.

These sobering insights suggest that we may inadvertantly be trading continued growth of our large urban systems for the integrity of our democratic processes. There seem to be fundamental incompatibilities between large scale political units and an effective representative democracy.

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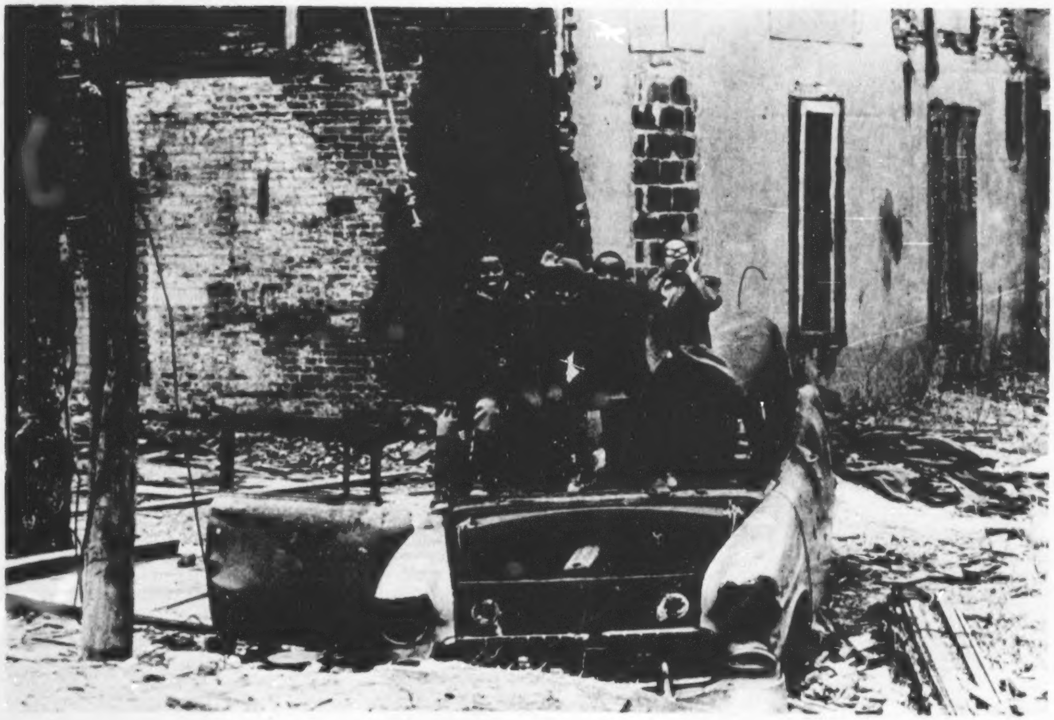

ENVIRONMENTAL QUALITY AND CITY SIZE

by

Duane Elgin

An important factor in judging the relative costs and benefits associated with different urban scales is environmental quality. At least in public perceptions, environmental quality seems to be particularly sensitive to scale differentials--agglomerations of people and economic activity are thought to be associated with environmental degradation. However, given the newness of the environmentalist movement, it is not suprising to find there is relatively little longitudinal or cross-sectional data with which to document the relationship between environmental quality and city size. Nonetheless, there is now sufficient information to reach some suggestive conclusions.

Air Pollution

With respect to air pollution, the National Center for Air Pollution Control (1968) plotted a "pollution rating" against population size and found that" ... air pollution is strongly correlated with population and is an unavoidable consequence of the agglomeration of people, cars and industry ... clean air for very large cities is inherently difficult to attain" (p. 28). Bigger cities, then, tend to have higher concentrations of air pollutants. Table E-1 indicates that average suspended particulate levels during the seven year period 1957-63 increased consistently with city size. Table E-2 shows similar data for 1969 to 1970--again indicating a general tendency for air pollution to increase with city size. In

Table E-1

SUSPENDED PARTICULATE MATTER LEVELS, BY URBAN POPULATION GROUPS: 1957-1963

Population Group	Number of Cities	Suspended particulate matter (micrograms per cubic meter) Minimum	Maximum	Arithmetic Average
United States total	232	5	1,706	115
10,000-25,000	6	11	539	80
25,000-50,000	23	5	679	85
50,000-100,000	80	6	982	111
100,000-400,000	92	10	1,706	113
400,000-700,000	19	18	977	128
700,000-1,000,000	7	14	658	129
1,000,000-3,000,000	3	34	594	161
3,000,000 and over	2	57	714	182

Source: "Air Quality Data," Statistical Abstract, 1966.

Table E-2

VALUES FOR POLLUTANT CONCENTRATION VERSUS POPULATION CLASS: 1969-1970

Population Class	Number of Sites	Concentration TSP*	SO^2	NO^2
Nonurban	5	25	10	33
Under 10,000	2	57	35	116
10,000	2	81	18	64
25,000	2	87	14	63
50,000	9	118	29	127
100,000	37	95	26	114
400,000	17	100	28	127
700,000	9	101	29	146
1,000,000	2	134	69	163
3,000,000	2	120	85	153
Slope		9.152	6.103	12.109
Intercept		41.467	0.733	44.000
r^2		0.748	0.590	0.719
t statistic		4.874	3.392	4.526

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*TSP : Total suspended particulates.

Source: Mitre Corporation, MTR-6013.

his study of the environmental outlook for a selected sample of U.S. cities, Van Tassel (1973) concluded:

> Considering only air pollutants related to automobiles, space heating, or power generation, the smaller cities covered all had reasonably satisfactory air in 1969 and good prospects for generally cleaner air by 1980. Again this relationship was roughly proportional to the size of the city, with air quality tending to deteriorate as city size increases....The conclusion is clear that in the small cities and rural areas, the air quality in 1980 is likely to be decisively better than it was in 1969. It also seems likely that air quality will tend to improve as city size declines. (p. 569.)

Hoch (1972) reached a similar conclusion with respect to air pollution: "Despite these sources of variability, however, there is generally a pronounced urban scale effect for major pollutants." (p. 248.)

Air pollution seems to be a source of public dissatisfaction which tends to vary, again, with city size; i.e., bigger cities seem to have a higher percentage of the population dissatisfied with air quality. For example, a Gallup Poll (1969) found that in cities of over one million people 55 percent said that air pollution was the most pressing environmental problem while only 23 percent of those in small communities and rural areas gave this answer.

Mortality Rates and Air Pollution

To the extent that air pollution increases as city size increases, then it seems plausible that mortality rates in larger cities could be higher than in smaller cities as a result of higher concentrations of air pollutants. Lave and Seskin (1971) have carried out extensive research relating mortality rates to pollution levels, as well as other socioeconomic variables, using data on 117 standard metropolitan statistical areas (SMSAs) for their observations. Based upon 1960 data, the estimated mortality rate due to air pollution is shown below (based on Lave and Seskin, 1971):

City Size	Annual Deaths per 10,000 Population
10,000-50,000	3.5
50,000-1,000,000	5.1
Over 1,000,000	6.2

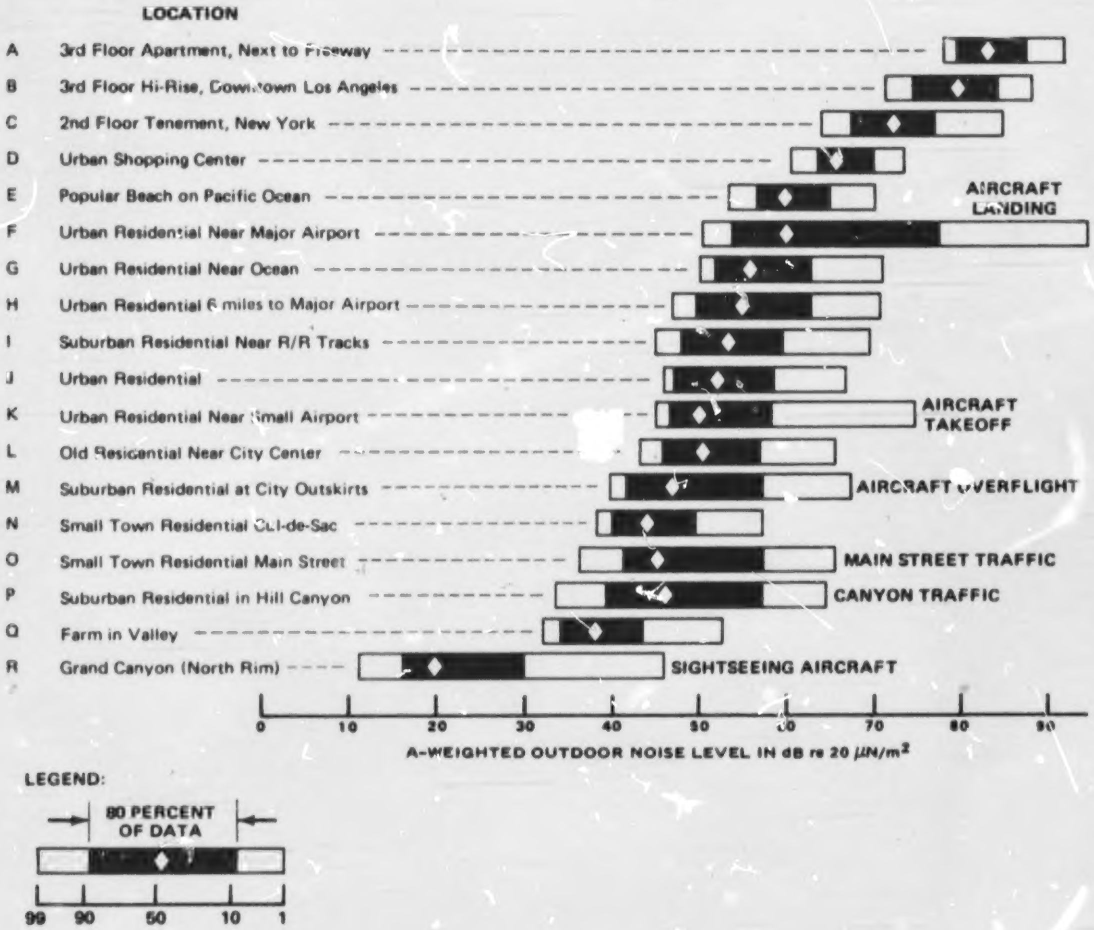
These results, while striking, must be qualified by noting that correlation does not prove causality. Further, the validity of the hypothesized relationship between mortality and city size is dependent upon the degree to which pollution is related to city size. Nonetheless, air pollution appears to be associated with city size and yet is not usually included in cost/benefit calculations.

Noise Pollution

It seems likely that bigger cities have a greater proportion of the population exposed to "unacceptable" levels of noise than do smaller cities (see Figure E-1). However, because noise has only recently been recognized as an environmental pollutant, there is very little information available on the number and percent of the population exposed to unacceptable noise levels as a function of city size. Nonetheless, some generalizations can be made. An examination of temporal and spatial factors related to transportation noise exposure furnishes some evidence supporting the proposition that bigger cities are noisier. Transportation vehicle noise tends to dominate most residential areas and seems, to a large extent, responsible for the recent general concern with noise. Since average work trip length increases with city size (as shown later, in Figure E-2) it seems reasonable to assume that people spend more of their time making and being exposed to transportation noise in bigger cities. It also seems reasonable to assume that unacceptable levels of exposure to noise in areas adjacent to urban freeways is more likely to be concentraced in the bigger cities where freeways tend to converge (EPA, 1972).

Figure E-1

THE RANGE OF DAYTIME OUTDOOR NOISE READINGS FOR 18 LOCALES



Source: Environmental Protection Agency, Report to the President and Congress on Noise, December 21, 1971, Figure 2-5, p. 2-12.

Noise pollution, then, is an additional disamentity or environmental stressor with unknown implications that seems to have some functional relationship to city size.

Commuting Distance and Traffic Deaths

Occupants of larger cities tend to travel further and spend more time on the streets and highways than do the occupants of smaller cities. Hoch (1973) concludes, "There is a fair amount of empirical evidence to support the obvious proposition that average distance to work and travel time increase with city size...." (p. 269.) This is illustrated in Figure E-2, which presents two scatter diagrams of average auto driver trip lengths and durations for commuting to and from work in 23 cities of various sizes.

In addition to the inconvenience of increased travel time, a consequence of spending more time on the streets of the larger cities is the greater risk of being involved in traffic accidents. Table E-3 indicates that larger cities generally have higher annual traffic deaths per 10,000 registered vehicles than do smaller cities.

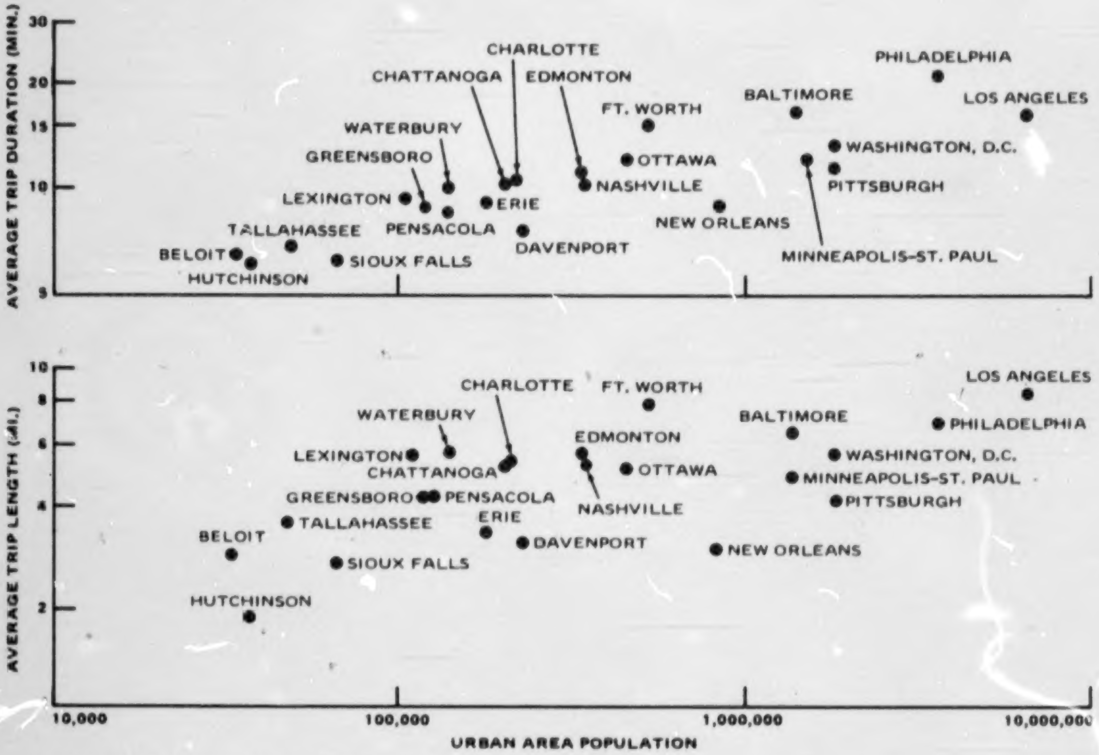
Yet another consequence of the larger area of bigger cities and the associated increase in travel times and trip lengths is the decrease in proximity to nonurban environments. Access is diminished relative to smaller urban places for a greater proportion of the population as urban size increases. This places an additional "cost in living" in larger urban places by decreasing proximity to and, in all likelihood, increasing the number of competitors for open space.

Climate Changes

Large cities, with their concentration of industrial activity, traffic, and housing affect their local climate--sometimes in significant

Figure E-2

AVERAGE AUTO DRIVER WORK TRIP LENGTH, DURATION, AND POPULATION FOR 23 CITIES



Auto driver average trip times and distance excludes terminal time effects.

Source: Alan Voorhees et al., (1966), pp. 24-26.

Table E-3

TRAFFIC DEATHS VERSUS CITY SIZE

City Size	Annual Traffic Deaths (number of per 10,000 registered motor vehicles)
10,000-25,000	2.1
25,000-50,000	2.0
50,000-100,000	1.9
100,000-200,000	2.2
200,000-350,000	2.4
350,000-500,000	2.8
500,000-750,000	2.7
750,000-1,000,000	3.3
Over 1,000,000	2.9

Source: Traffic Safety (1973), pp. 32-34

ways. As indicated in Table E-4 cities tend to have less sunshine, more rain, less wind, and higher temperatures than do rural areas. This is primarily due to the combined effects of thermal pollution (heat generated from myriad urban activities) and air pollution (which cuts down on amount of sunshine) and buildings (which cut down on ground surface air flows). Hoch (1972) states that the impact of these man-made climate changes "tends to increase with city size," (p. 257).

Garbage Collection and Waste Treatment Costs

As indicated in Table E-5, there are increasing garbage collection costs associated with increasing city size. However, because of income differentials between larger and smaller urban places, the proportion of income spent for garbage collection seems indeterminately related to

Table E-4

CLIMATIC CHANGES PRODUCED BY CITIES

Element	Compared with Rural Environs
Radiation	
Total on horizontal surface	15 to 20% less
Ultraviolet, winter	30% less
Ultraviolet, summer	5% less
Cloudiness	
Clouds	5 to 10% more
Fog, winter	100% more
Fog, summer	30% more
Precipitation	
Amounts	5 to 10% more
Days with <0.2 in.	10% more
Temperature	
Annual mean	1 to 1.5°F more
Winter minima	2 to 3°F more
Relative humidity	
Annual mean	6% less
Winter	2% less
Summer	8% less
Wind speed	
Annual mean	20 to 30% less
Extreme gusts	10 to 20% less
Calms	5 to 20% more

Source: Helmut E. Landsberg "City Air--Better or Worse," Table 1

Table E-5

SOLID WASTE COLLECTION COSTS
(166 Cities)

City Size	Average Cost per Ton	Cost per Ton for Median City
10,000-100,000	$ 9.50	$ 9.90
100,000-500,000	10.20	10.64
Over 500,000	24.05	12.78

Source: U.S. Bureau of Solid Waste Management
1969, p. 266

city size. In any event, the amount of income spent for this purpose (less than one percent of annual median family income) seems to make any differences related to city size economically trivial.

With respect to sewage treatment, costs decrease as city size increases to 100,000 and then costs seem to level off and perhaps turn upward at scales beyond 100,000. Table E-6 presents data on sewer services charges, in the form of annual revenue per capita, for 61 cities. Revenue first declines with size but then increases, suggesting that a U-shaped cost function may hold. (Hoch, 1972, p. 260.) Again, the cost differentials between large and small cities are so small as to make sewage treatment relatively insignificant as an factor in cost/benefit considerations.

A more significant factor with respect to sewer systems is the cost of changeover from "combined sewer systems" in larger (and therefore generally older) cities. Historically, sewers in cities were first employed to carry storm water runoff. With the growth of urban density in the 19th century, the need for domestic sewage transportation was met with "combined sewers," i.e., sewers joining domestic house drains to the existing system

Table E-6

ANNUAL REVENUE PER CAPITA FOR SEWER SERVICE
(61 Cities, 1962)

City Size	Annual Revenue per Capita (average for sample)	Sample Size
Under 10,000	$9.28	8
10,000 to less than 40,000	6.72	30
40,000 to less than 100,000	6.08	11
100,000 and over	6.31	12

Source G. Szego (1968), pp. 97-99

of storm drains. Table E-7 clearly suggests that cities over 500,000 are much more likely to have the older combined sewers, either exclusively (32 percent) or in combination with separate sewers (41 percent). This table also shows that combined sewers become more prevalent as city size increases, again reflecting the fact that bigger cities tend to be older. The negative environmental impacts of combining storm runoff and sewage transportation include the flooding of basements with a mixture of sewage and storm water during very heavy storms, and the large pollution loads imposed on waterways as the storm water carries off raw, untreated sewage. The estimated costs for handling the combined sewer problem nationwide range from $15 billion for partial separation to between $30 and $100 billion for complete separation (Hoch, 1972, p. 263). And, since the larger cities are the primary locus of this problem, they will bear a substantial portion of the cost for installation of the new systems. This, in turn, may confer a substantial cost/benefit advantage to the smaller and newer communities which have, in place, separate sewer systems.

Table E-7

PERCENT OF EACH TYPE OF SEWER WITHIN POPULATION GROUPS

City Size	Percent of Reported Cases of Communities With: Separate Sewers	Combined Sewers	Both Separate and Combined Sewers
Under 500	95.5%	3.5%	1.0%
500-1,000	90.2	7.6	2.2
1,000-5,000	85.5	10.3	4.3
5,000-10,000	81.0	10.4	8.6
10,000-25,000	78.3	13.2	8.5
25,000-50,000	71.3	13.9	14.8
50,000-100,000	65.8	22.4	11.7
100,000-250,000	52.4	22.6	25.0
250,000-500,000	58.3	19.4	19.4
Over 500,000	27.3	31.8	40.9
Total	85.2%	9.7%	5.1%

Source: U.S. Federal Water Quality Administration, *Municipal Waste Facilities* (1968), p. 35

Planning for Environmental Quality

As indicated in Table E-8, there do seem to be some economies of scale in the financing of planning activities, i.e., per capita planning costs decrease as city size increases. There are several qualifications that must be made, however. First, this is an input measure which does not describe the quality of the planning output as a function of city size. This seems a particularly important point, given the complexity of larger urban systems and the inherent difficulty in effectively planning the growth of such large systems. Second, the cost differentials

Table E-8

TOTAL PLANNING EXPENDITURES VERSUS CITY SIZE

City Size	Per Capita (median)	Per Agency (median)	Number of Agencies Reporting
Under 10,000	$2.995	$ 19,600	2
10,000-24,999	2.279	40,200	45
25,000-49,999	1.394	46,900	82
50,000-99,999	1.293	81,200	94
100,000-249,999	1.014	159,600	58
250,000-499,999	1.003	343,200	18
500,000-999,999	1.011	546,500	15
1,000,000 and over	0.475	950,600	5
Total	$1.313		319

Source: Yondorf (1972) p. 15

are so modest as to be trivial in making cost/benefit comparisons between cities of different sizes.

Innovation

The application of new technology is an important factor in coping with many of the environmental problems identified earlier. Therefore, the ability to innovate as a function of city size seems an important criterion in weighing the "coping potential" of urban places. In general, larger cities seem able to innovate more rapidly than smaller cities. There are several plausible reasons for this disparity:

- For larger cities, the need for a new technology may be more compelling because the environmental problems may be more substantial.

- An innovation advantage is conferred on the city that can purchase a sophisticated technology--such as computer equipment and new fire-fighting equipment--whose cost is high in absolute terms but low as a proportion of the total available budget.
- A pricing advantage is conferred an the larger city that can purchase innovations in larger quantities at a discount.
- Larger cities are generally more adept at obtaining outside funds from state and federal sources. They are more knowledgeable about these sources of additional funds and about the oftentimes complex procedures necessary for acquiring them.
- In larger cities, there is often a greater degree of staff specialization and sophistication, which allow better identification of sources, performance characteristics, and uses of new technologies. Further, these staff specialists are also able to conduct purchase negotiations in a more efficient and effective manner than their smaller-city counterparts.
- Present in larger cities and often absent in smaller cities are technology-based industries and universities. Not only are these a potential source of actual innovations, they also provide social, political, and economic pressure to innovate.
- From the perspective of the firm selling new technology, it is easier to maket to ten larger cities than it is to market to a thousand smaller communities.

There are several recent developments, however, which may enhance the ability of smaller cities to innovate. There is some federal support for developing the internal capability of smaller cities for innovation. In addition, technology transfer programs are beginning to provide an equivalent of the external infrastructure missing in smaller cities. Finally, some smaller communities that are geographically close, are beginning to band together in order to purchase technologies that they could not afford alone.

Conclusions

The following conclusions emerge with respect to environmental quality and city size:

- Air pollution is strongly correlated with increasing city size.
- There is suggestive evidence that mortality rates increase as city size increases owing to increased concentration of air pollutants.
- Noise pollution is correlated with increasing city size.
- Increased commuting time is correlated with increasing city size.
- Traffic deaths are correlated with increasing city size.
- Significant man-made changes in local climate are correlated with increasing city size.
- Increased garbage collection and waste treatment costs are associated with increasing city size but the differences are trivial.
- Changeover costs for separate sewer systems would be enormous for larger and older cities.
- Planning costs decrease with city size but the differences are trivial.
- Larger cities seem to be better innovators.

Taken together, these findings indicate significant environmental disamenities associated with increasing scale. Hoch (1972) concludes: "... the cumulative impact of the evidence lends strong support to the widespread intuition that environmental quality declines as urban scale increases," (p. 247.) Van Tassel (1973), in his case studies of environmental quality, concludes: "Overall, America's smaller communities stand to gain more with respect to quality of life in the next decade that the larger cities do." (p. 571.)

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THE ECONOMICS OF CITY SIZE

by

Tom Thomas

The cities are in trouble again. This statement has both a cross-sectional and a longitudinal dimension. Cross-sectionally it is part of an increasing chorus of reformers pointing to the ills found in our large cities--pollution, racial problems, drugs, violence. Longitudinally this statement can be thought of as just one more example of an anti-city bias which dates back as far as cities themselves. Yet from ancient Mesopotamia to the Athenian polis to the Italian city states of the Renaissance to modern Paris, the city has been the most important nexus of any civilization. The decline of its cities has been one indicator of the decline of a civilization.

The seemingly inexorable growth of the cities over the centuries has in fact not been constant. For example, during the period of the plagues in Western Europe, the cities underwent major depopulations until the technologies of sanitation and medicine were adequate to the problem.

Three of the main determinants of feasible modern city size are societal security, economics, and technology. A change along any of these dimensions means an adjustment of city size. For example, cities of the size and density of New York, Tokyo, London, and Rome were not feasible until the vertical technologies and their support systems gave rise to the modern skyscraper, while the horizontal technologies of movement developed high speeds.

This paper takes primarily a cross-sectional perspective and concentrates on economic issues. I assume that there will be no major scientific, social, or psychological breakthroughs in the next few decades that will change the economics of city size. Rather, the purpose is to present economics of city size and the way in which the current production function with its economic incentives and disincentives will influence the cities.

The theories of city growth will be examined to highlight the nature of the incentives for growth. Then the economics of three major components of city life, business, government and individual activities, will be examined. Each provides a different focal point and different cost/benefit considerations. At the end of this discussion some speculation will be made on the overall implications of the data for national growth policy.

Theories of Urban Growth and City Size

There are many theories to explain the growth and importance of cities over the centuries. Both classical economic theory and common sense suggest that as the size of an urban area increases there will come a point at which the net incentives for individuals and firms to locate there will become negative. However, most of these theories attempt to explain the process of urban growth in general rather than the effect of a particular city size.

Adam Smith and his followers simply applied to spatial questions the same type of "market equilibrium" analysis applied to other aspects of the economic system. Thus if location A had a more favorable production function in terms of larger marginal physical products for the factors of production than location B, location A would bid up the price of these factors and attract them until the marginal revenue product of the factors in A and B became equal. Of course, such a crude theory explains little. Space itself has not historically played an important role as an explanatory variable. There is no indication of the problems and costs associated with the movement of labor or of the costs of moving goods across space. The emphasis in the theory of adjustment was on an equilibrium movement toward some intermediate level of factor or product prices.

In recent years economists concerned with the development of the so-called underdeveloped countries have suggested a new perspective.* This center-periphery theory suggests that the location of economic activity may be part of a system which, when disturbed, leads to cumulative disequilibrium and growth of the urban core.

Perloff and Wingo (1965) have applied this theory in the context of American development; Costello (1966) has discussed it in relation to the South vis-à-vis the rest of the nation; and Friedman (1966) has done both theoretical development and applied work.

The theory posits that in an urban area with a wide diversity of industrial and commercial activity which is surrounded by a large area in which the population density is lower and in which primary production--agriculture, mining, fishing--is of importance, the following sequence of events is likely to occur. Expansion will take place more rapidly in the center, since it is relatively well endowed with industries producing products for which the income elasticity of demand is high, while growth in the periphery will be slow because of the low income elasticity of demand for the products of agriculture. Population will be drawn to the metropolitan areas by high wages and by the negative stimulus of lack of opportunity in the rural areas. Generally speaking, the migration will be selective, with the better trained and more ambitious individuals moving to the cities and the less well educated and the less ambitious remaining in the periphery.

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*The explanation of the center-periphery theory and its empirical critique in this paper draws heavily upon the writings of Lee et al., (1972), pp. 37-46.

In addition to these basic demand and income considerations, the urban center has a number of other factors supporting its growth. For example, the application of new technologies that support higher wages usually requires heavy investment. Frequently the most important source of investment funds is the retained earnings generated by the urban industrial sector itself. In addition, the savings of the work force are available for borrowing. In rural areas, firms have less market power and are likely to be facing a competitive cost squeeze that limits retained earnings. A relatively low wage level may lessen the margin for saving. The net effect is likely to be a worsening of the periphery's position vis-à-vis the urban center.

The urban center is also more able to provide a broad array of public services supported by a local tax system that yields more funds per capita from the relatively high levels of income. Transportation facilities will be provided; education will be of a relatively high quality and will include programs of vocational as well as academic content. The effect of this will be to make the new generation of workers more productive, thus justifying higher incomes. In the rural areas the community will be hard pressed to maintain even a minimal level of public services. Sewage and water services may be inadequate. School budgets are likely to be so limited that the skill level of the remaining population may even decline over time.

As a final example, the large urban areas generally support large universities. In turn, the research laboratories that are a part of the modern university complex support the research-based high-technology industries which tend to cluster in the urban area. Technological improvement in the rural areas, on the other hand, may be largely confined to the knowledge disseminated from the state land grant college via the county agricultural agent.

The center-periphery theory is primarily of interest in terms of the specific factors it points out that contribute to urban development. It is the capital markets, public services, and industrial and knowledge specialization that appear to contribute not only to urban growth at the expense of the periphery or rural area, but also to the growth of some cities so that they become extremely large while others appear to stagnate.

However, if we reverse the perspective and ask about rural depopulation, we would have to place much more emphasis on farm mechanization and the drastic reduction in the need for farm labor than on the elements of the center-periphery theory. Interestingly, over the last few decades, as the depopulation of rural America resulting from mechanization has slowed, the pattern of increasing concentration in urban centers has also shown signs of reversal. Theories have been advanced to explain these changes consistently with the center-periphery theory.

A two-step process is suggested as a modification to the center-periphery theory. First, the most technologically advanced industries develop in the urban centers, where knowledge and capital can most easily be brought together to produce a new product or to initiate a new process. Then, as the industry matures, it becomes less dependent upon highly skilled technicians and the infrastructure provided by the center, and tends to disperse to other localities. Such has been the experience in the U.S. textile, apparel, and footwear industries. To the extent that this does occur, of course, some dispersal of general economic activity is accomplished.

There is considerable empirical support for this "trickle down" thesis. The percentage share, in national manufacturing employment, and the percentage change for 1963-66, of different types of counties, are shown in Table F-1. The increase in manufacturing employment was less than the national average in the traditional industrial areas, particularly in the counties containing major cities. In general, growth was most rapid in areas distant from the usual manufacturing areas, and it was greatest in the counties that were not incorporated in industrial areas and that had no city with as many as 100,000 people. However, the share of manufacturing in the "remaining counties" was not greatly different from what it had been in the past.

Table F-1

MANUFACTURING EMPLOYMENT BY TYPE OF COUNTY

	Percent Share 1966	Percent Change 1963-66
Counties including principal cities of industrial areas	41.2%	9.6%
Satellite cities and remainder of industrial area	15.6	10.0
Other counties with cities over 100,000 but not in industrial areas	8.4	11.8
Important manufacturing counties outside industrial area	10.8	13.7
Remaining counties	24.0	16.9
All counties	100.0%	11.9%

Source: E. Lee, et al., June 1971, p. 39

Another piece of evidence of the diffusion of economic activities can be found in the decreasing dominance of the large metropolitan areas: see Table F-2. In terms of population, the New York metropolitan area is a declining percentage of the United States and of all metropolitan areas. The ten largest metropolitan areas have grown slightly as a percentage of the entire U.S. population, but their dominance as a percentage of all metropolitan areas has declined.

Table F-2

POPULATION DOMINANCE OF LARGE METROPOLITAN AREAS
1940-1970

	1940	1950	1960	1970
New York metropolitan area as percent of United States	8.9%	8.6%	8.2%	8.0%
New York metropolitan area as percent of all metropolitan areas	18.6	15.3	13.1	11.8
Ten largest metropolitan areas as percent of United States	24.8	26.0	26.6	26.8
Ten largest metropolitan areas as percent of all metropolitan areas	51.8	46.4	42.2	39.3

Source: Census of Population, 1950 and 1970

So far, however, the shift in location of economic activity toward the more dispersed counties is modest. We can probably expect that some industries will continue to "filter down" from places of great population density to places of lower population density. In fact, this may be the major hope of some of the smaller cities and rural areas of the South and Midwest. Population estimates for counties in 1966 indicated that many of the counties that had been heavy losers of population in the two preceding decades had begun to grow again, even though fertility had fallen.

However, the type of economic activity that has filtered down may be of little value in narrowing the income differential between one area and another. The location of branch plants in the South during the last two decades has done little to narrow the North-South per capita income differential, since the relatively highly paid employment in supporting activities (sales, promotion, research, legal, etc.) continues to be carried on in the North.

Nevertheless, the largest urban areas may not continue to hold all their economic advantages. Baumol (1967) contends that large cities may experience a disproportionate increase in costs. He divides economic activities into those in which improvements in technology can be expected regularly to increase labor productivity and those in which productivity increases are sporadic. For purposes of his model, Baumol assumes wages in these two sectors to increase together. With technological progress in the one sector, costs in the nonprogressive sector must rise. One possible result may be that products or services of the nonprogressive sector may be priced out of the market. According to Baumol, another possibility is that "...if their relative outputs are maintained, an ever-increasing proportion of the labor force must be channeled into nonprogressive activities and the rate of growth of the economy must be slowed correspondingly." (p. 420) Baumol identifies manufacturing with technological progress, and many service-type activities as nonprogressive. Since he argues that a large proportion of the services provided by cities are of the nonprogressive sort, it follows that increases in city size may result in a "disproportional increase in external costs." Larger cities will, he feels, have increasing difficulty in providing essential services, and to the extent that they fail to keep pace with the demands for such services, their loss of population and enterprise will aggravate the problem of providing services for those that remain. He then finds a system of cumulative disequilibrium building up, analogous to that which led to the rapid city growth in the first place, except that this system works toward a dispersal of economic activity from the large urban cores to the suburbs or smaller cities.

To date the decentralization that has taken place involves, for the most part, the development of the urban periphery which can be viewed as an addition to the "city's" size rather than a subtraction from it. There has been relatively little movement of industry into isolated smaller cities. In depressed areas, such as Appalachia, there have been attempts to provide the type of financial support and public services that appear to have formed the basis for the growth of the large cities. Such attempts have not been particularly effective. Many would argue that the attempts were never made on a large enough scale to be successful, yet careful examination reveals that other major variables--such as individual initiative and highly trainable or specialized labor forces--were lacking which are much harder to supply through government intervention.

It appears highly doubtful that the economic forces in big cities or the economic incentives that governments up to now have chosen to create to aid smaller cities could significantly reshape the spatial configuration of the American economy. Future outward movement of industry and population due to economic forces is seen as only relaxing the pressure on the central cities, not reducing their size.

City Size Factors Affecting Business Firms

An economy characterized by large and specialized productive activities requires a great many exchanges in the production and distribution of goods and services. Most exchanges require the physical movement of goods and people. The exchange of labor for wages and salaries and the related commuting are the best known and most widely studied of such exchanges. But retail sales and sales of goods and services by one business to another are equally important.

Physical movement of goods and people requires large amounts of valuable resources, including the time of travelers and the inputs of the transportation system. Up to a point, large cities economize on the use of resources in transportation and communication by the proximate locations of many related economic activities. The question is, at what point might the congestion, pollution, taxes, higher land costs, higher wage cost, and so forth, lead firms to leave the large cities?

The crucial cost element in the operation of most firms is the cost of labor, which on the average accounts for 65 percent of gross operating cost. Economic theory teaches us that labor is paid its marginal revenue product (as of course are all the other factors of production). Thus, if hourly earnings increase with urban size, we can assume that the productivity of labor has increased with urban scale and hence that the economics of urban scale to the firms on the average outweigh the diseconomics.

This is exactly what one finds. Irving Hoch (1972) made some estimates on wage rates by both city size and density. In Table F-3 are the results of regression estimates he made holding region constant for five specific job categories. The effects of city size and density are approximately equal.

Table F-3

ESTIMATED WAGES FROM REGRESSION EQUATIONS: WESTERN REGION

SMSA Population (thousands)	Density (thousands)	Keypunch Operators Class B	Steno's General	Switchb. Operat. Recepts.	Typists Class B	Auto Mech.	Laborers Material Handling	Janitors etc.
Wage rates per hour								
100	1	$1.69	$1.85	$1.62	$1.57	$2.96	$2.23	$1.77
100	25	1.75	1.88	1.76	1.60	3.10	2.54	1.94
10,000	25	2.15	2.32	2.18	1.90	3.64	2.80	2.10
Index (lowest size density group = 1.00								
100	1	1.00	1.00	1.00	1.00	1.00	1.00	1.00
100	25	1.04	1.02	1.09	1.02	1.05	1.14	1.10
10,000	25	1.27	1.25	1.35	1.21	1.23	1.26	1.19

Source: Hoch (1972), p. 242

Hoch then went on to make comparisons with earlier work by Fuchs. To do this it was necessary to delete the density variable because Fuchs's estimates were based only on city size. This deletion increased the importance of the city size variable in Hoch's data because SMSA population and density are positively correlated at the 0.67 level.

Table F-4 compares the estimates from Table F-3 with the actual average wages of five of the six occupations (switchboard operator/receptionist is excluded). All data are in index terms, with the base as the smallest SMSA class in the West. Individual occupation wage values estimates from Hoch and Fuchs were then tested against the hypothesis of equality. This was done by subtracting the former from the latter estimates, for given region and city size, and testing the hypothesis of a zero population mean for the difference variable. The test statistic obtained was 1.1, so the hypothesis was accepted, i.e., there is no significant change in income differential by city size over a decade. The result is more suggestive of compensatory payments than of disequilibrium.

Alonso (1970 also worked with Fuchs's data (1967), displaying them in a slightly different form and using them to highlight earning differences by sex and race (see Table F-5). Contrary to what might be expected, the disadvantaged (by either race or sex) do better the larger the city. From rural to the larger urban areas, the increase in wages overall is in the order of 40 percent. Alonso indicates that there is some evidence--but very weak--that for SMSAs of over 3 million inhabitants, there may be some turn down in earnings.

As a final bit of evidence, Table F-6 displays the data collected by Douglas on payroll and value added in SMSAs. Most crucial is the evidence that the net output of a worker--his output (value added) minus his costs (payroll)--increases with urban size even to the 5 million and over class. In fact, because there is a minor decline in payroll in the

Table F-4

COMPARATIVE WAGE INDICES

Region and SMSA size (thousands)	Fuchs Estimate (1969)	Five-Occupation Average (1968-69)
Northeast		
125	0.95	0.94
375	0.95	0.99
750	0.48	1.02
2,000	1.09	1.06
North Central		
125	1.02	1.00
375	1.02	1.04
750	1.10	1.07
2,000	1.15	1.12
South		
125	0.88	0.84
375	0.93	0.89
750	0.95	0.92
2,000	1.05	0.96
West		
125	1.00	1.00
375	0.99	1.05
750	1.04	1.08
2,000	1.13	1.14

Source: Hoch (1972) p. 243

Table F-5

RATIO OF ACTUAL TO "EXPECTED" HOURLY EARNINGS, BY CITY SIZE, UNITED STATES, 1959

	White Males	White Females	Non-white Males	Non-white Females
Rural	0.83	0.83	0.78	0.76
Urban Places				
Under 10,000	0.84	0.84	0.75	0.63
10,000 - 99,999	0.91	0.88	0.76	0.78
Standard Metropolitan Statistical Areas				
Under 250,000	0.97	0.94	0.84	0.76
250,000 - 499,999	0.97	0.96	1.04	0.90
500,000 - 999,999	1.02	1.03	1.07	1.00
1,000,000 and over	1.12	1.13	1.10	1.19

Note: "Expected" hourly earnings were calculated for each sex and color by multiplying the national average hourly earnings of each color and sex by age and education by the annual hours worked by members of that cell in the region, summary in each case across all such cells in the region, and dividing by the total man-hours of the region.

Source: Adapted by William Alonso, November 1970, p. 14, from V. Fuchs, 1967.

Table F-6

INDEXES OF VALUE PER EMPLOYEE ADDED, PAYROLL, AND NEW CAPITAL: LARGEST SMSAs IN 1963

Population (thousands)	Payroll Index	Value Added Index	Value Added Minus Payroll Index	New Capital Index
250 - 500	0.994	0.970	0.943	0.967
500 - 1,000	1.029	1.047	1.099	1.028
1,000 - 5,000	1.061	1.046	1.029	0.925
5,000 and over	1.058	1.053	1.129	0.784

Source: Ibid., Alonso, 1970; based on data in R. Douglas (1967) largest population category (as Alonso suggested) while value added still increases, the net output of workers takes a dramatic jump in the 5 million and over category.

In conclusion, the data show overall, urban areas, even the largest urban areas, appear to provide business firms with benefits that exceed costs. To the extent that urban growth is the result of preferences of firms--rather than of government or individuals--cities of up to 3 million at least, appear to offer significant incentives to business, or at least to some types of firms. It is to this question of incentives by type of firm that we now turn.

Locational Decisions

Given the nature of mass production, the ideal plant is usually all on one floor to facilitate work flow. This leads to the requirement for a large one-story building spread over many acres; acres which are very high cost in central cities.

There are many problems associated with small towns, including the inadequacies of transportation nets and lack of a skilled labor force, to mention two. The result is that many firms choose to locate at the periphery of large SMSAs rather than go to small towns (thereby enlarging the SMSA and increasing its sprawl), but the trend is clearly away from the urban center.

On one hand, the central city appears to be increasing in terms of firms providing white collar jobs. Table F-7 shows that office buildings (and white collar jobs) are the smallest component of growth outside of SMSAs. These are the types of jobs that can be concentrated in skyscrapers, which make intensive use of urban center land. The types of occupations cited in the trickle down theory are not the white collar jobs but rather are the type that require the large land use.

Table F-7

PERCENT OF NEW BUSINESS BUILDING OUTSIDE CENTRAL CITIES OF SMSAs, BY REGION (1960-1965)

Type of Building	North-east	North Central	South	West	United States
Industrial	71%	59%	46%	69%	62%
Stores and other mercantile buildings	68	57	34	56	52
Office buildings	26	30	22	32	27
Gasoline and service stations	61	52	39	57	51

Source: Urban and Rural America, 1968; from Dorothy K. Newman, May 1967

On the other hand, a prevalent myth with respect to location is that face-to-face communications and physical proximity of key executives in an industrial society must take place in urban core areas--particularly in central business districts (Gold, 1972). It is further suggested that advances in communications technology, computer technology, and air transportation make it possible to centralize control of corporate operations and these forces make location in major downtown areas more attractive with their physical proximity to other corporate offices (Regions Growth, 1967, p. 117.) Gold (op. cit.) disputes the validity of this perspective:

> ...the kernel of truth contained in these statements, namely the need for instant communication among key executives, has been overstated to the point where it no longer reflects reality; for the very factors that are said to encourage the concentration of elite office function... are proving instead to be the harbingers of its undoing. These technological advances have enabled even the largest national companies to be dispersed over the metropolitan landscape and yet remain in direct and constant communication with each other (p. 463).

Gold further notes that the relocation trend of major business firms which began as a minor movement in the mid-1960s has become by 1971, "a mass exodus whose true dimensions are beginning to be visible in only one central city, New York, where the concentration of economic activities at the center is greatest" (p. 463). In 1965, 125 major industrial corporations had their home offices in New York city, by 1971, at least 24 of these companies had decided to leave the city for the surrounding suburbs, mainly in New Jersey and Connecticut:

> Although the decentralization of office employment seems most advanced in New York, other cities such as Detroit, St. Louis, Philadelphia, Baltimore, Houston, Atlanta, and Los Angeles are beginning to experience corporate moves to their suburban rings. (p. 463)

It would appear that as far as the urban center is concerned, most of the growth will occur in those types of firms that can operate effectively from multistory buildings. Such industries tend to be non-polluting or less polluting than high land use industries. This trend would appear to offer some hope of improvement of the urban environment if the twin problems of urban transportation and mass clusters of poverty can be solved. Such a solution would be fortuitous because the service (white collar) sector is the fastest growing sector of our economy.

Average versus Marginal Costs

Individual firms make their locational decisions based upon average costs and benefits. On the other hand, the "socially" correct decision looks at the marginal costs and benefits of adding one more firm to the urban area.

The point at which marginal benefits become negative is at a scale larger than the point at which the difference between average benefits and average costs is a maximum. Therefore if this point of maximum difference has not yet been reached, it can be concluded, that, even on a marginal cost basis, some further expansion in urban size and/or density may be warranted as far as firms, individually and collectively, are concerned from a profit-making standpoint. Table F-6 had some evidence of this point: the net difference between value added and payroll is still expanding with urban areas over 5 million. Thus it appears that firms which are able to make use of the benefits of high density environments (and therefore presumably the ones that locate in large cities) have not yet found the cities too large in scale. The economic advantage of large SMSAs over small SMSAs is not overwhelming, being about a 10 percent increase in productivity. However, even if the increase were one 1 percent, this is $10 billion in a trillion dollar economy. This is not meant as an estimate per se, but rather as an indication of the sums of money involved.

City Size Factors Affecting Government

The general argument is often made that one of the reasons cities have grown so large is that government disproportionately aids the city. There are a multiplicity of arguments that can be made, e.g., regional government offices tend to be in large cities, thereby increasing employment and also making it easier for firms in large cities to receive government services and contracts; better statistical information is provided by the government on large SMSAs; large cities have been favored in the development of transportation networks; and so on.

A number of studies have looked at the costs of providing basic services in cities--highways, police and fire protection, sanitation and sewage, parks and recreation. Measurements have been made of both expenditure and employment (employment is seen as a way of controlling for varying price levels.) The results of such studies have been generally undistinguished (ACIR, 1968, pp. 45-50). They considered mainly the effect of the city size variable, with only a few secondary analyses of the effect of city density and rate of growth. Moreover, the quality of the services was not measured.

The results tend to indicate that for cities of 25,000 and 250,000 the per capita cost of government is approximately constant. Above 250,000 there appears to be some small increase in the per capita cost of most services. However, both increasing density and increasing rate of growth tend to decrease the per capita cost of services, apparently because of more intensive utilization of the services and equipment (effects one would expect in large cities).

For our purposes, an examination limited to the costs of providing services does not appear to be nearly as appropriate as an analysis of the "burden" of providing these services (at a given quality level). This burden can be lightened either by decreasing the cost of the services or increasing the tax base that provides the income to pay for them. It is entirely possible that the slight increase in the cost of government services in large cities is more than covered by the increase in the potential tax base, i.e., the per capita output.

Unfortunately, the desired data do not appear to be available for the United States, although some are available for other countries. Alonso (op. cit., 1970) states:

> In every country for which I have found evidence, the local product per capita (or some index for it, such as income or wages) rises with urban size, and where comparable figures on cost are available, these rise far more slowly if at all. Although all of the data one might wish for are not available for any single country, the overall pattern is clear (p. 10).

Two sets of data which he presents are for West Germany and Japan. Table F-8 presents estimates of the West German Gross Community Product per capita and public expenditures per capita. The product rises by 40 percent from small cities (20,000 to 50,000) to large cities (above 500,000). The costs, on the other hand, increase by 44 percent, thus requiring a larger percentage expenditure per capita. However, given the relative magnitude of product and cost figures, the excess of product over costs rises by more than 30 percent.

The data for Japan, developed by Mera and shown in Table F-9, are organized by density of prefectures, with the densest areas corresponding to the largest cities. Income per capita rises smoothly by nearly 80 percent. While the curve of government expenditures is U-shaped, it is very shallow, partly because of the centralized nature of the Japanese system which--according to Mera--provides for a fairly uniform level of public services throughout the nation. Indeed, the Japanese variation in per capita government expenditure is only about half that of the American or West German equivalent.

Perhaps the most surprising element in the Japanese data is the sharp decline with increasing density in Social Overhead Capital Stocks (SOCS) per capita. This runs counter to common belief that the bigger the city the more infrastructure per capita is needed, and may be the result of such effects as the greater linear quantities of roads per capita necessary in low density areas. The lowest SOCS per capita are for the penultimate density class, but this class consists of a single prefecture adjacent to Tokyo, and presumably shares some of the advantages of Tokyo's size. Yearly government investment expenditures--which may be interpreted as marginal SOCS--are also U-shaped, declining at first and rising for the densest two classes. However, such investment may be expected to be more a function of the rate of population growth than of the actual density.

Table F-8

GROSS COMMUNITY PRODUCT AND PUBLIC EXPENDITURES PER CAPITA, GERMAN FEDERAL REPUBLIC, 1964

Population (thousands)	Gross Community Product per Capita (DM)	Public Expenditures per Capita (DM)	Public Expenditures as percent of G.C.P.	Excess of G.C.P. over Public Expenditures
20 - 50	5,400	513	9.5	4,900
50 - 100	6,400	627	10.5	5,400
100 - 200	5,900	603	10.2	5,300
200 - 500	6,400			
500 - 1,000	7,500	738	10.4[*]	6,400[*]
1,000 and over	7,500			

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[*] The arithmetic mean of the figures was used for this composite class.

Source: Alonso, op. cit. 1970, p. 11

Table F-9

JAPANESE PER CAPITA INCOME, GOVERNMENT EXPENDITURE, AND SOCIAL OVERHEAD CAPITAL STOCKS (SOCS)

(Mean Per Capita Values in Thousands of Yen)

Population Density (persons per sq km)	Number of Prefectures	Mean Income (1965)	Mean Government Expenditure (1965)	Mean SOCS (1963)	Mean All Government Investment Expenditure (1966)
Fewer than 200	17	188.0	50.8	268.5	32.8
200 - 300	15	197.6	46.7	244.8	27.3
300 - 600	8	209.1	43.2	206.4	27.6
600 - 1,000	3	228.0	41.9	205.3	27.5
1,000 - 3,000	1	280.0	53.7	178.4	40.5
3,000 and over	2	340.0	56.1	188.0	39.4

Note: 1960 population in all cases.

Source: Alonso, op. cit., 1970, p. 12; adapted from K. Mera, 1970

The relevance of these data to the United States is not conclusive, but it seems unlikely that currently government is imposing any financial burden on the rest of the country to support the largest SMSAs, or that the burden for standard government services is higher on the residents of large SMSAs. However, two expenditures are not included in these analyses: education and welfare. However, these expenditures are only indirectly a result of city size, i.e., through the higher wages and welfare payments which occur in the large SMSAs. It is likely in the future that at least welfare payments will be federalized and also an increasing portion of education costs.

On balance, it appears that general economics of city size is basically neutral in its effects on the costs and benefits of government services. However, the "special" economics of minority and poverty in the largest SMSAs is deserving of profound attention in any study of the economics of a national growth policy.

City Size Factors Affecting Individuals

The Enclosure Acts in England drove large numbers of persons off the land. Since then, a continuing series of "misfortunes" have beset the rural worker in many countries, not the least of which in America has been the agricultural revolution. The net result was to drive large numbers of persons to the cities. At this point in our history the flow from the countryside to the major SMSAs has slowed to a trickle, if only because there are so few persons left outside major SMSAs. If we are once again reaching a point where one has a viable economic choice between different living densities and city sizes, then individual preference becomes more meaningful.

Three major components of individual preferences are the amount of real income, job opportunity and satisfaction, and family and leisure time activities. The evidence already given clearly indicates that persons who are employed earn more the larger the SMSA, at least up to cities of 3 million. These greater monetary earnings usually result in greater real income, i.e., that the cost of living in the large SMSAs does not more than eat up the dollar increase in wages. Table F-10 indicates that on the average a person can expect to reach a higher monetary standard of living in the larger urban areas. The decisions of specific individuals that involve money income are presumably at a much more disaggregated level of occupation structure (see Hoch, 1972, p. 241.) Nevertheless, there would appear to be definite reasons for the more economically aggressive to choose large urban areas.

Table F-10

DEFLATED MONEY INCOME LEVELS FOR STANDARDIZED POPULATION

Local Population (thousands)	Assumed average Population Size (thousands)	Deflated Wage Rate Northeast	 Central	 South	 West
Urban place:					
< 10	5	0.984	0.921	0.869	0.957
10 - < 100	50	0.979	0.975	0.928	0.990
SMSA:					
< 250	125	0.973	1.064	0.980	1.033
250 - < 500	375	0.953	1.045	1.028	1.003
500 - < 1,000	750	0.970	1.111	1.042	1.039
1,000 +	2,000	1.056	1.119	1.122	1.106
1,000 + relative to (<10)					

Source: Hoch (1972) p. 241

The second factor is job opportunity and satisfaction. If the job is highly specialized and requires a large support population, it is likely to be a large city job. If you want to be the account executive for a major firm or sing in opera, you have to go to a large city. On the other hand, most of the jobs in large urban areas are not highly specialized (most of the jobs in New York city could be as easily found in a small town, e.g., typist, clerk, construction worker). The city offers a wide variety, though not necessarily a high level of occupations.

The final aspect--family and leisure time activities--is not strictly an economic question. First leisure time will be considered mainly as it relates to the specialization possible in large cities. At one end of the scale are cultural activities and sporting events that usually require a large support base, e.g., symphonies, operas, museums, zoos, professional team games. The high culture and mass events of any civilization have generally been a function of the major urban centers of the civilization (even when a few philosophers and ascetics have retreated to the countryside).

At the other end are cultural activities and sporting events that are done by the individual or in very small groups. The cultural and mass events are not well attended in terms of the number of persons in the same city who bowl, play the guitar, or engage in hobbies and crafts. The leisure activities of many, and indeed the fastest growing leisure time activities like tennis, camping and boating, are individualistic. They are either not facilitated or actually inhibited by the high density and large scale of the major SMSAs. Thus the leisure time preferences of the mass of persons in the cities would be benefited by being able to live in smaller SMSAs or independent towns.

The second aspect, family activities, is mixed. Central cities themselves have a very bad name--for many good reasons--as a place for raising children. On the other hand, the "good school and public service systems" tend to be found not in small SMSAs or rural areas but in the suburbs of the large SMSAs. On balance, the existing quality of life in the suburbs of the larger SMSAs (probably not the very largest though) are probably a net attraction for family life. This is not to say that many families might not wish the same quality of public service in smaller SMSAs.

The picture that emerges is one in which the average individual chooses to live in large cities for income and job opportunities (or live in the suburbs and commute). Results from opinion polls, discussed elsewhere, suggest that many Americans would prefer smaller scale living, especially if they didn't have to give up many of the advantages that many large SMSAs offer, at least in their suburban ring.

Summary

In summary, it can be stated that the current economics of city size appears to be neutral or slightly favorable to the largest SMSAs--those over one million residents. The type of occupations represented in central cities will be increasingly service, with manufacturing employment moving toward the urban periphery of smaller urban centers.

The cost and benefits of government are also either neutral or slightly favorable to the large SMSAs. However, the analyses to date have no quality variable and do not cover the cost of education and welfare. In both welfare and education, large SMSAs face major problems.

Finally, from the perspective of the individual, the large SMSAs appear to offer on the average significant advantages to those most interested in the development of a specialized field of competence and obtaining high economic rewards. For personal leisure, the cities offer high culture and mass sporting events. Those who look to these areas for their social life and leisure time activities will tend to want to locate in a large SMSA. On the other hand, the greatest growth in leisure time activities occurs in the individual or small group participation activities, for which large SMSAs are at best neutral and usually very negative. Family life appears to be well supported in the suburban rings of all but the very largest SMSAs.

If federal and state intervention were used to lessen the differential in job opportunities between large and small SMSAs, many individuals would hasten to increase the skilled labor market supply in smaller SMSAs. The economic policy issues, for which this paper has only provided a context for analysis, is: what type and magnitude of planned intervention would be required to significantly change existing urban-suburban growth patterns. The evidence presented in this paper indicates that despite widespread and vocal dissatisfaction with our largest SMSAs, economics continues to favor the growth of the large if not the largest SMSAs in the United States.

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